

# THE IRON AGE

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Reading Matter Contents.....page 596  
Alphabetical Index to Advertisers " 198  
Classified List of Advertisers " 188  
Advertising and Subscription Rates " 601

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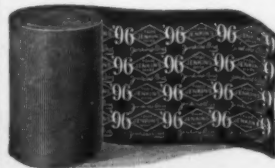
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# THE IRON AGE

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AUG 19 1909

New York, Thursday, August 19, 1909.

## WATSON-STILLMAN HYDRAULIC SHEARS.

To the line of hydraulic tools manufactured by the Watson-Stillman Company, New York City, two new machines have been added, a beam shear and a coping machine. The frames of both machines are steel castings, on account of the greater strength under tension and torsion as compared with cast iron for a given weight. Figs. 1 and 2 are general views of the beam shear and Figs. 5 and 6 of the coping machine. The

operating pressure of 1500 lb., but cylinders can be furnished for any pressure from 1000 to 3000 lb. In shops where the line pressure falls below these figures the machine can be operated through an intensifier. Where the work varies in size a variable pressure intensifier is an advantage, as using the lowest pressure required saves power.

From the sectional elevation of the machine given

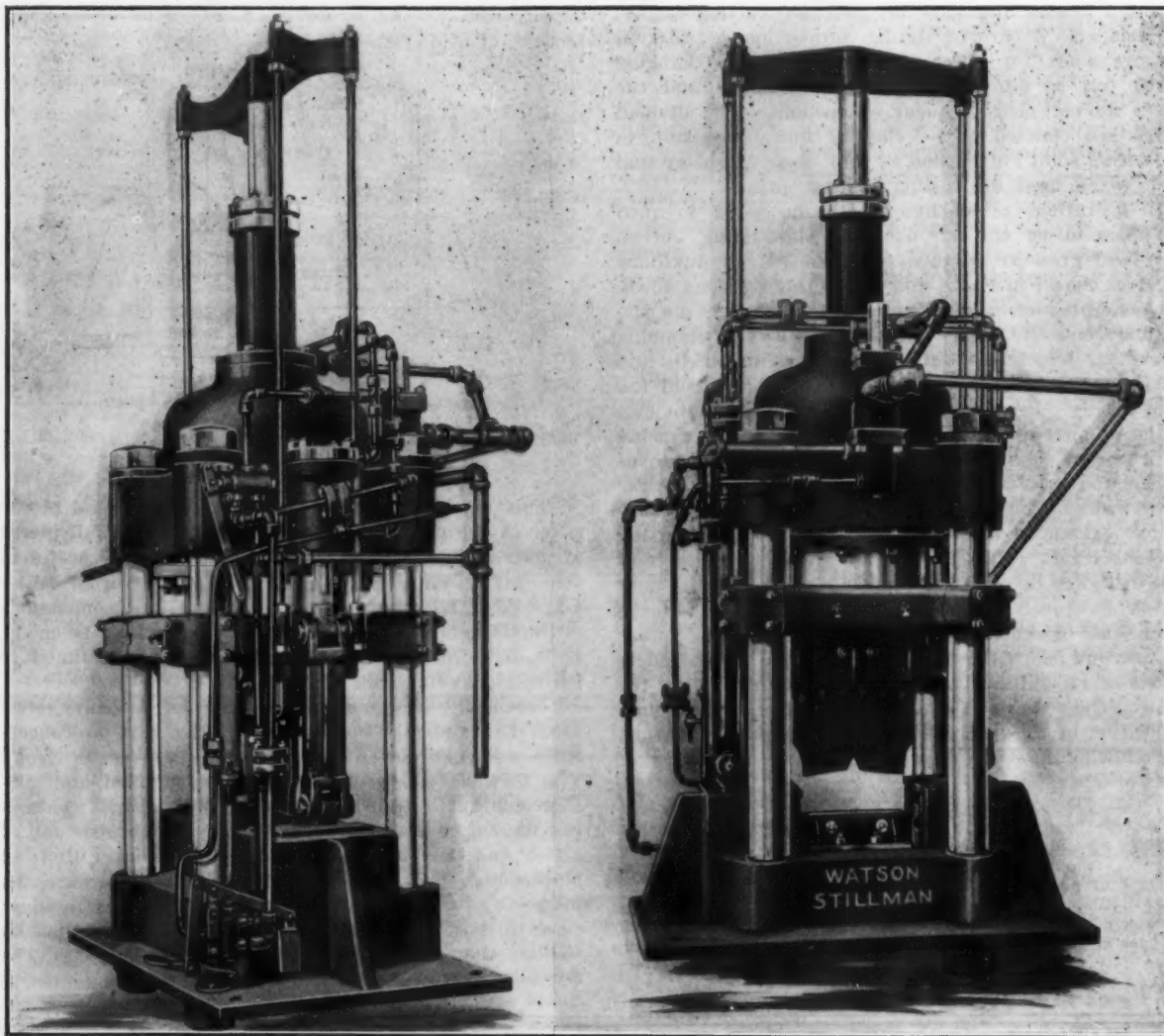


Fig. 1.

Two Views of a New Hydraulic Beam Shear Built by the Watson-Stillman Company, New York City.

Fig. 2.

remainder of the illustrations show the construction of these two machines and help to bring out the interesting mechanical features which are described later.

### The Hydraulic Beam Shear.

This machine is intended for cutting I beams, channels, tees, flat bars, angle irons, corrugated channels, Z bars and other structural shapes, and may also be used to cut round and similar sections if expedient. By removing the cutting mechanism the machine is converted into a powerful hydraulic press for general work. The operation of the machine is controlled by one hand lever and one foot lever, and each cut is made quickly and at a single setting. Two sizes are built, one cutting sections having a longest dimension of up to 15 in. and the other up to 24 in. Both are regularly made for an

in Fig. 4 it will be seen that the beam is supported from underneath and at the sides by double stationary knives which conform to its shape and form a slot into which the upper knives descend. During the cutting the lower knives are supported by the lower platen, while those at the sides are wedged into a position which gives them the solid backing of the frame. As the upper knives descend they first pass through the web of the beam and into the slot between the lower knives. As they continue to descend they are parted by the dividing post and, swinging outward, pass through the flanges. Fig. 3 illustrates three stages in the cutting. All parts of the cut are made directly against solid backing and through a practically equal thickness of metal at all points. The horizontal movement of the upper knives through the flanges and the firm support of the beam on all sides

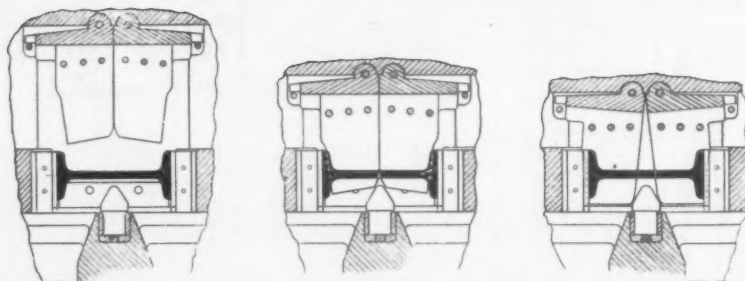


Fig. 3.—Three Stages in the Cutting of the Web and Flanges of an I-Beam.

does away with the tendency toward distortion. A clean cut is obtained and with the least expenditure of power. The gripping and releasing of the beam before and after cutting are automatic and are controlled by operating a hand lever of two auxiliary cylinders, as described later.

The blades shown in Fig. 3 are the standard type for cutting I beams and may be used for cutting angles, channels and Z bars of similar proportions. Different sets are made for different sizes of beams; changing knives can be accomplished in five minutes and the knives do not need frequent sharpening. The divided knives are claimed to be cheaper and less likely to break than solid knives, and as they wear can be ground down to be used for cutting smaller sizes.

In operating the machine the beam is run in until the place to be cut is under the descending knives. Hydraulic pressure is then admitted to the auxiliary cylinders shown in Fig. 4 and forces their pistons down. The piston movements are transmitted through the piston and connecting rods on each side to two clamping wedges on which the outer shears are mounted, and which compel these flange shears to grip and hold the beam rigidly. Pressure on the foot lever shown in Fig. 1 then admits pressure into the main cylinder, causing the ram to descend and drive the shearing knives through the beam after the manner before described, the knives swinging on the centers O O, Fig. 4. The pressure is next exhausted from the main cylinder by releasing the foot lever. This allows the pressure in the pull back cylinders to raise the ram and knives for the next cut. The lateral pressure against the beam is relieved by a second movement of the hand lever, this time to admit pressure below the pistons of the auxiliary cylinders and thus raise the clamping wedges, after which the beam can be removed. The metal clippings drop through the bottom of the machine into a pit in the foundation.

Following are the dimensions of the two sizes of beam shears:

	For 15-in. beams.	For 24-in. beams.
Diameter of main ram.....	21 in.	25 in.
Stroke .....	9¾ in.	12 in.
Diameter of pull-back cylinder.....	4 in.	6 in.
Stroke .....	9¾ in.	12 in.
Diameter of clamping cylinders.....	3¾ in.	3¾ in.
Diameter of clamping cylinder piston rods.....	2¼ in.	2¼ in.
Stroke .....	4½ in.	4½ in.
Weight .....	12,000 lb.	16,500 lb.

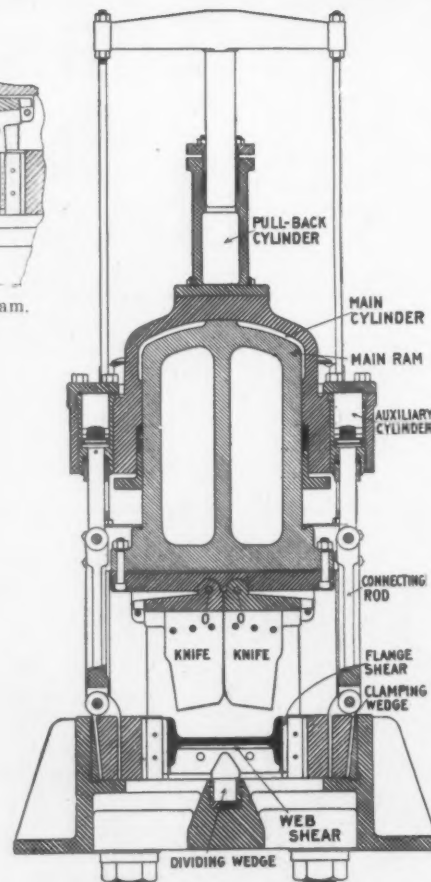


Fig. 4.—Sectional Elevation of the Watson-Stillman Hydraulic Beam Shear.

#### The Hydraulic Coping Machine.

This machine is offered as a time, labor and power saver in the trimming of structural shapes, small pieces of plate metal, bar iron, &c. It is particularly useful in steel mills, shipbuilding plants, structural iron, boiler and locomotive shops, and wherever splices, connections or cuts similar to those shown in Fig. 8 must be made. It is light and durable, and in cutting is claimed to leave a smooth, clean edge.

Essentially the machine consists of a heavy steel beam hydraulically operated from the rear to concentrate extreme power upon shearing knives in front. The forward end of this lever is so divided and constructed that by the removal of a pin the half containing the upper right hand knife may be thrown out of action and the knife left standing at its upper limit of movement. The divided upper knife also permits the insertion of a web or flange when it is desired to shear close to those parts, and is very handy for certain cuts smaller than the combined area of both knives. The lower or stationary knives are bolted to the plates in

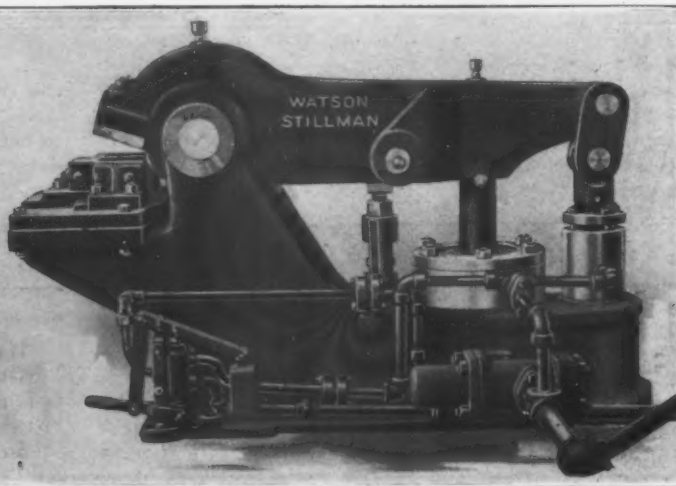
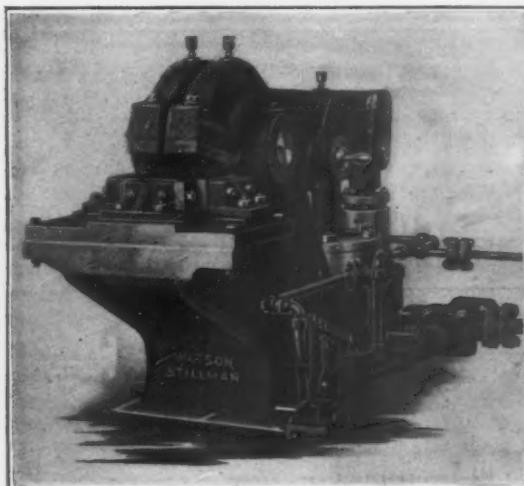


Fig. 5.

Fig. 6.

Two Views of a New Hydraulic Coping Machine Built by the Watson-Stillman Company, New York City.



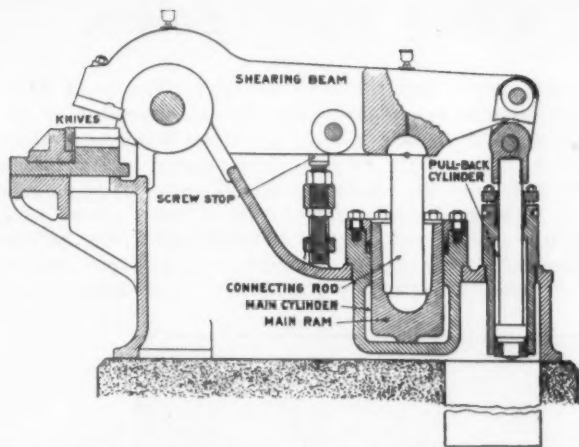


Fig. 7.—Sectional Elevation of the Watson-Stillman Hydraulic Coping Machine.

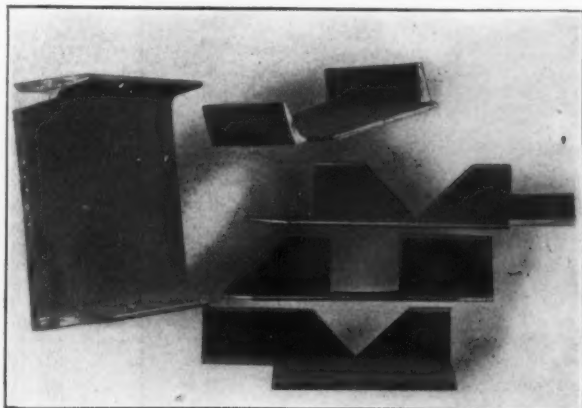


Fig. 8.—Examples of Work Done on the Watson-Stillman Coping Machine.

such a manner that those on any side may be removed without disturbing the others.

The construction offers a large number of cutting combinations, and as the change can be made from one to another in a minute the machine is very convenient in making cuts at odd angles. The machine is operated by a foot lever shown in Fig. 6. While the work is held in position this lever is depressed, which admits pressure to the main cylinder, Fig. 7. The upward movement of the ram, transmitted through the ball ended connecting rod to the shearing beam, makes the moving knives travel to their lower limit. Releasing the foot lever permits the liquid to exhaust from the main cylinder and at the same time pressure is thrown on the top of the piston in the pull back cylinder, which brings the shearing beam back to its original position.

The length of the lever stroke is adjustable and is determined by setting a screw top between the main bearing and the cylinder, as shown in Fig. 7. It is thus possible to reduce the stroke to that most economical of power while a large number of similar cuts are being made. The main cylinder is ordinarily built for a pressure of 1500 lb., but can be had for higher or lower pressures. The body of the machine is heavily ribbed along the lines of greatest stress and is not likely to break under the heaviest work to which it can be put. The diameter of the main ram is 9 in. and its stroke  $7\frac{1}{2}$  in. The diameter of the pull back piston is 4 in. and the body of the rod 3 in. The machine weighs 4700 lb.

The R. Munroe & Sons Mfg. Corporation, Pittsburgh, has placed an order with R. D. Wood & Co., Philadelphia, Pa., for what is claimed will be a larger hydraulic flanging press than any so far installed in the Pittsburgh District. It will be used for pressing out boiler and tank heads and other special work. Its capacity will take in plate work  $\frac{3}{4}$  in. thick and 10 ft. in diameter. The company manufactures the Munroe patent water tube boiler, builds tanks, plate work, &c., but is arranging its plant for larger and heavier work. A 10 ft. 6 in.

gap riveter is also being added. Recent shipments of complete work include four 40-ft. cement dryers for the Universal Portland Cement Company, Universal, Pa., and three sulphuric acid tanks for a large sheet plant, in addition to the general run of tanks, stacks, &c.

### The British Foundrymen's Association.

The annual meetings of the British Foundrymen's Association are of interest in the United States, apart from the papers and discussions, in view of the fact that the organization was patterned after the American Foundrymen's Association. At the sixth annual convention held at Birmingham, England, August 3 and 4, there was an attendance of about 75 members. F. J. Cook, Birmingham, was re-elected president. The report of the council for the past year showed a net gain of 66 members, the present membership being 448. The American Foundrymen's Association showed a membership of 724 at its Cincinnati convention in May of this year. The latter is in its fourteenth year, and the number of foundries in the United States is presumably several times that in Great Britain.

The principal papers at the Birmingham meeting were on the metallurgy of cast iron, and the association appears to be traversing ground covered several years ago by the American Foundrymen's Association. Little comes out at the British meetings on molding machines, foundry construction or the mechanical advances and the improvements in melting equipment that have marked foundry development in the United States in the past few years. "Twenty-five Years of Cast Iron," "Foundry Practice" (as related to control of mixtures and of cupola operation), "How Chemical Compounds Affect Cast Iron" and "The Structure of Cast Iron" were the chief subjects treated at the recent meeting. In the last named paper results of research on the effect of structure upon the physical properties of cast iron were presented, as carried on by F. J. Cook and George Hallstone, Birmingham. The authors tabulated the results of two series of casts, A and B, each representing 60 consecutive days working with irons mixed to give the same chemical composition, but each series made up with different brands of pig iron. It was found that the highest tensile result in the A series was lower than the lowest in the B series, the test bars of the former ranging from 8.7 to 12.9 tons per square inch and of the latter from 13.1 to 18.3 tons. The transverse tests on 1-in. square bars, 12 in. centers, ranged from 19 to 28.5 cwt. for the A series and from 25 to 32.25 cwt. for the B series. On  $\frac{1}{2}$ -in. bars, 12-in. centers, the transverse tests ranged from 390 to 550 lb. for the A series and from 375 to 570 lb. for the B series. The study of micrographs of unetched sections showed that high physical properties are associated with a netlike formation of the phosphorus, and also that the graphite when in the elongated form appeared to split up the phosphorus eutectic and prevent this formation. The question of the tendency of the graphite to take either an elongated or a finely divided form was, in the authors' opinion, more a question of the way in which the pig iron had been made than of its subsequent treatment in the foundry.

The summary of tests showed that the results of the  $\frac{1}{2}$ -in. transverse bars of the A series, which had low tensile strength, were slightly higher than those of the B series; and from this, together with the evidence of chilled and unchilled bars made from low grade iron, the authors concluded that, with ordinary commercial pig irons, no matter what their chemical compositions might be, there is a rate of cooling which gives high physical properties, the structure of the iron then being associated with a netlike formation of the phosphorus eutectic and the cementite when present.

The Glen Mfg. Company, Ellwood City, Pa., has added a welding machine, heavy punching machines and other equipment, and is now operating double turn. It manufactures ornamental iron work, and has recently secured a number of contracts, among which is the railing for the Ohio River bridge at Sewickley, Pa.



## The Erie City Vertical Water Tube Boiler.

In an attempt to produce a boiler retaining all of the good points but eliminating the defects of the vertical type, the Erie City Iron Works, Erie, Pa., has developed one containing several novel features. The arrangement of the drums affords a large steam liberating surface and storage capacity and maintains a solid water surface over the tubes, reducing losses by radiation, and the boiler may be kept clean externally while under fire. Fig. 1 shows an exterior view of the boiler—i. e., encased

and no parts inaccessible for cleaning. The lower drum is not embedded in brickwork, but is suspended by the tubes which connect it with the upper water and steam drum. The weight carried by each tube in supporting the drum and its contained water is less than 50 lb., and the curving of the outside banks of tubes allows each tube to expand and contract independently. The builder recommends the use of a superheater, and one can be very readily applied to this boiler. The steam inlets

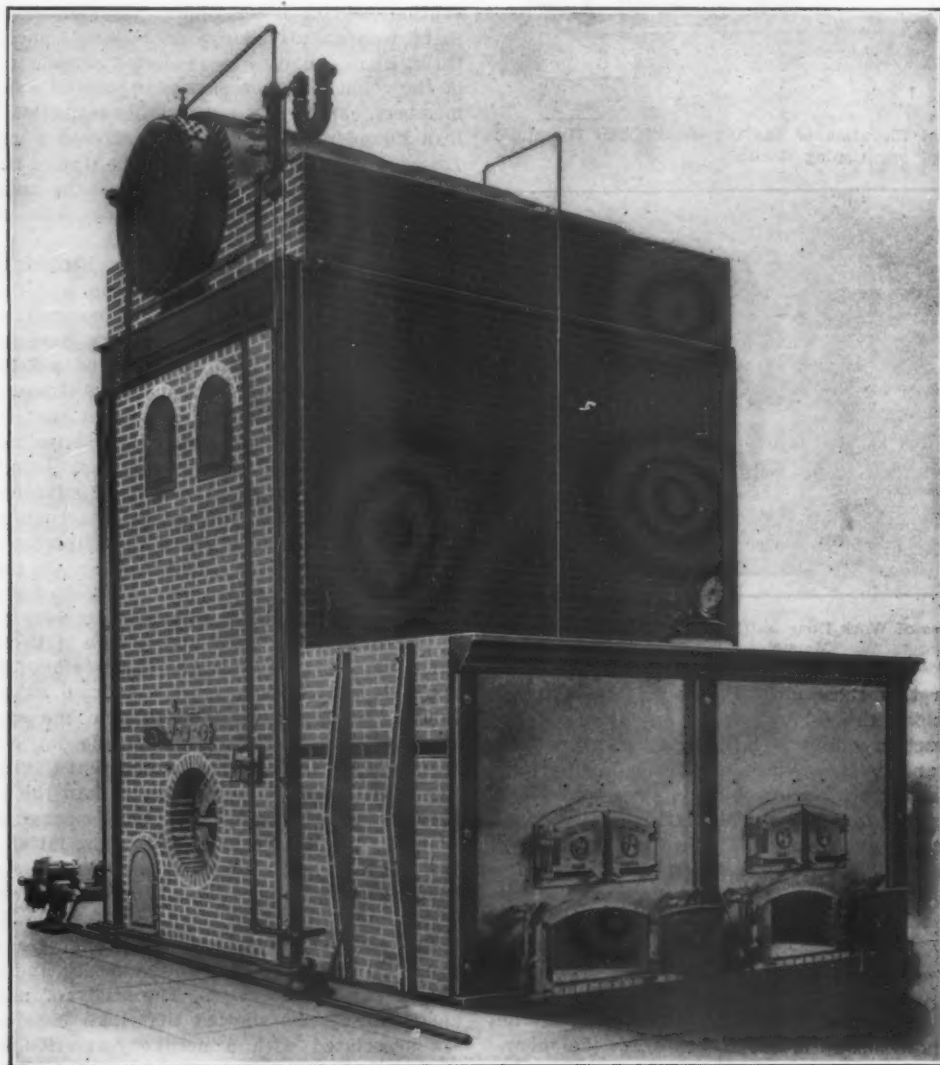


Fig. 1.—General Exterior View of the Vertical Water Tube Boiler Built by the Erie City Iron Works, Erie, Pa., Complete with Setting.

in its setting—but the best idea of its interior arrangement may be had from Fig. 2. Essentially the boiler proper consists of upper and lower horizontal drums connected by three series of vertical tubes, over and along which the hot gases are compelled by baffles to travel successively, as indicated in Fig. 3.

The drum shells are of open hearth homogeneous steel plate of 60,000 lb. tensile strength. The edges of the plates are bevel planed for caulking. The circumferential seams are single riveted and the longitudinal seams are double butt strapped, triple riveted. The heads are of the same material as the shell and are dished to a proper radius to avoid the necessity of internal bracing. As regularly built the drums are designed for a working pressure of 150 lb., but can be built for higher pressures.

In the boiler there are no details of complicated shape, no flat surfaces, tie rods, water legs, headers, return bends, outside circulating pipes, only two drums, very few hand holes, no baffles or mud pipes in the drum, no short nipples, no horizontal seams exposed to heat,

and outlets can both be placed at the front of the boiler, where they are most accessible.

### Details of Construction.

The manner of supporting the boiler may be seen in Fig. 2. As has been said, the lower drums and the tubes are hung from the upper drum; the latter is supported on cast iron saddles resting on I-beams, in turn supported by I-beam columns. The spaces between the banks of tubes are wide enough to admit a man to inspect, clean or repair the tubes. Of the eleven lines of tubes, five are similar to the symmetrically placed five, so that there are only six different shapes of tubes. The tubes with the greatest bends are bent only to a 27-degree radius, which offers no difficulty to the passing of an air or hydraulic turbine cleaner to remove scale. Moreover, scale forms less rapidly in vertical tubes; very much of the scale forming matter falls into the lower drum before it can attach to the tubes. Laterally across the boiler the tubes are nested in pairs, with sufficient space left between them for removing and replacing a tube. In the rear of the setting is a large

dust chamber, where the fine dust and ashes carried over with the gases collect without obstructing the flow of the gases.

An essential to the production of dry steam is a large disengaging surface which this boiler has in the entire water surface in the upper drum. There is, therefore, little disturbance of the water surface and no restriction of the water circulation. The tubes enter the drum well below the water level, which also prevents vibration of the latter and insures dry steam. Where

tubes from burning out; hence the necessity of repairs to the boiler itself is extremely remote. The setting is simple and substantial and not subject to derangement other than the natural wear of furnace linings. Ample provision has been made with binders and skewbacks for holding the arches, preventing expansion and insuring their lasting.

#### Repairing and Cleaning.

To remove an inner tube the tube is cut as near the tube sheet as possible, passed through the space between

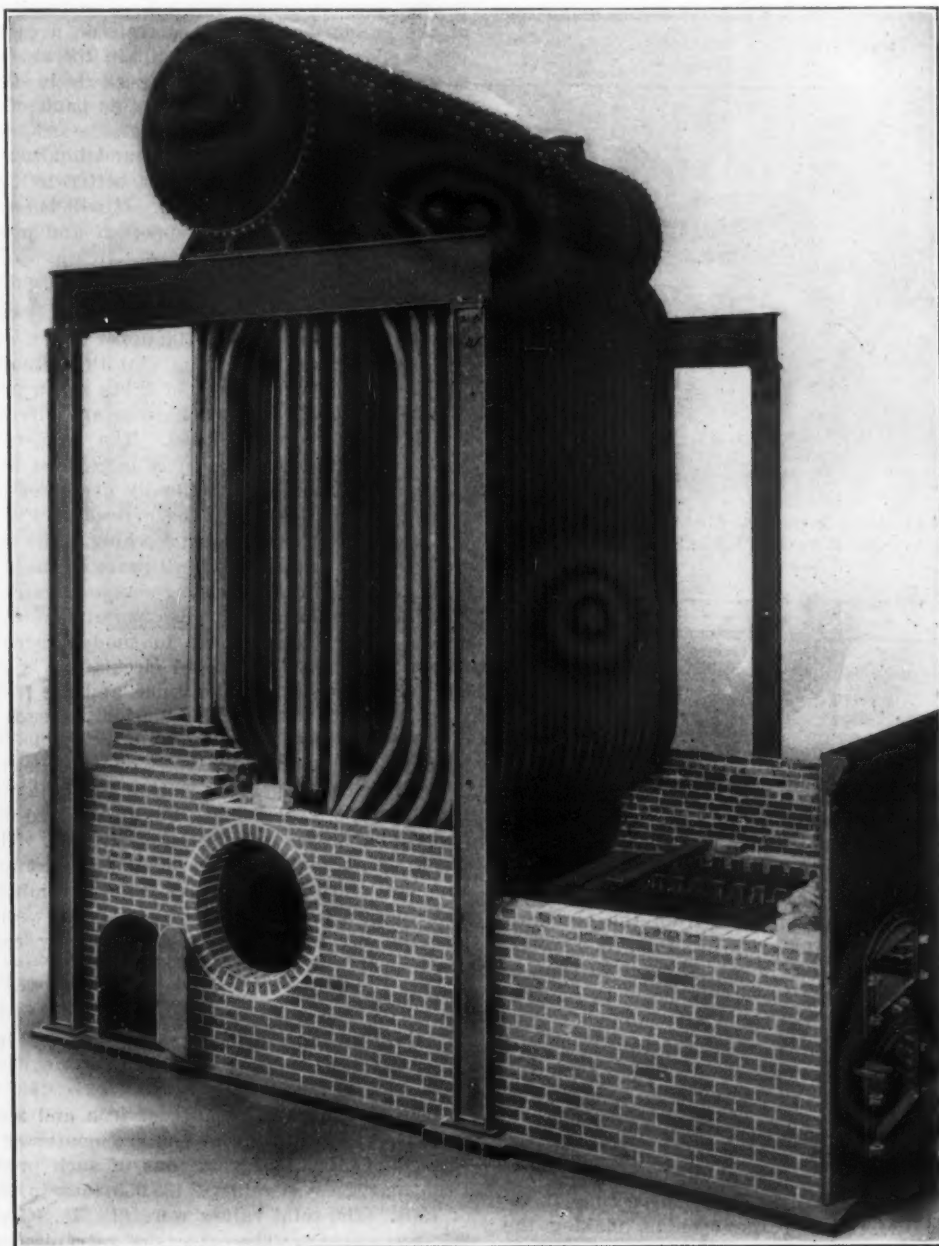


Fig. 2.—A Partly Set Boiler, Showing the Tubes and Drums.

a boiler is at times subject to sudden overloads, or where a poor quality of water is likely to cause surging, a special device is provided. As shown in Fig. 4, there is a steam storage compartment or internal steam drum at each end of the upper drum, and a steam pipe is placed in the drum reaching to both end compartments. To the ends of this pipe are attached steam separators, passing over the heads between the steam and water compartments. With this device dry steam is secured whether the boiler is operated at its rating or as far above it as it can be forced. This is one of the most important of the new features of the boiler.

Because it has no thick plates and longitudinal seams exposed to the fire the boiler is free from parts likely to get out of order. The prevention of scale in the hottest tubes, the facilities for keeping the boiler clean, the rapidity of the water circulation and the impossibility of forming steam pockets all combine to protect the

tubes and removed from the setting through either the side or top doors. Any tube may be replaced without disturbing any other tube, distorting the tube sheet or damaging the fire tile baffles, which may be removed if necessary. Ample cleaning doors are provided both in the sides and rear of the setting, so that the exterior of the heating surfaces may be kept clean and all accumulations of soot, ashes, &c., blown off as rapidly as formed by using a steam blower pipe which is furnished with the boiler. There is little opportunity for soot to adhere to vertical tubes anyhow, and as the tubes are in parallel rows, not staggered, it is easy to reach between the tubes to clean them by hand if necessary.

#### Fuels Available.

The large space available for the furnace enables the grates to be proportioned for burning low grade coal. By properly reducing this grate surface better grades of coal can be used, making the fire chamber and grate

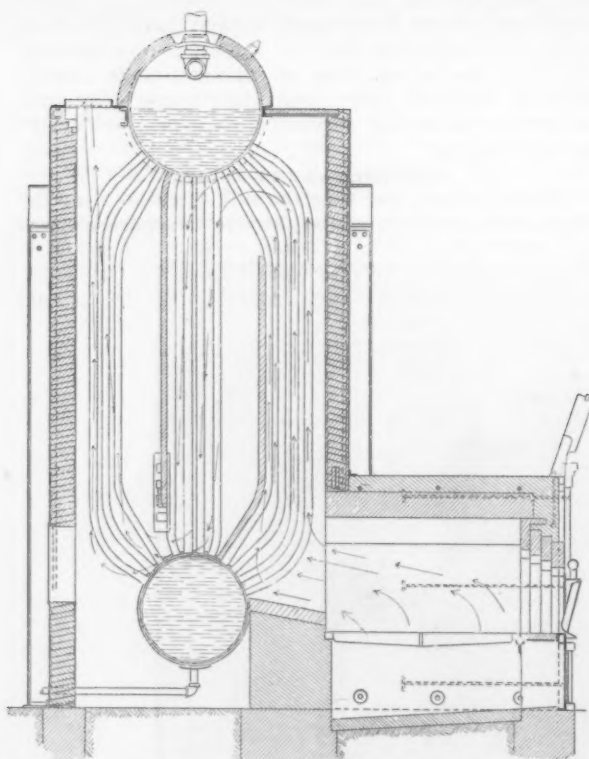


Fig. 3.—Sectional Elevation of the Erie City Boiler, Showing the Course of the Hot Gases.

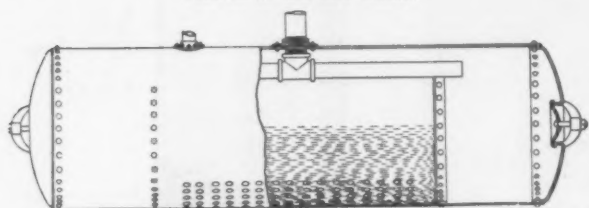


Fig. 4.—Detail of the Upper Drum, Showing the Steam Storage Space.

surface flexible for different kinds of fuel. By lowering the grates to the level of the firing floor an excellent furnace for burning wood can be had, and for burning oil or gas the only change needed from the standard furnace is to cover the grates with firebrick, so disposed as to admit the required supply of air, and to provide at the rear of the grates a loose checker work wall of firebrick, against which the flame will impinge. Any of the various makes of stokers can be readily applied and the furnace can be arranged for hand firing and for using coke oven or blast furnace gas at the same time.

#### Other Details of Construction.

Two access doors, as shown in Fig. 1, are placed in the side of the setting directly under the supporting I-beams. These are convenient when inspecting or removing tubes. Directly over the opening, making the manhead of the lower drum accessible, is a cast iron

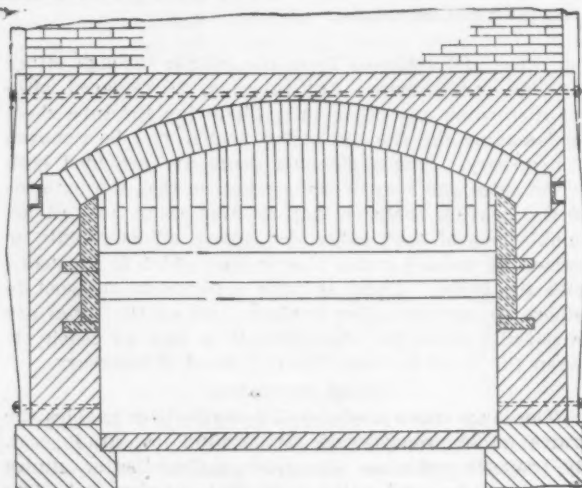


Fig. 5.—Vertical Cross Section Through the Furnace.

frame with three openings, which permits a steam blower to be inserted to remove ashes accumulating on the upper surface of the lower drum. It has been found that these deposits are light and easily removed. Lower down there are also two manhole openings, which make all of the tubes accessible for inspecting and cleaning.

The firebrick tiling forming the baffles between the tubes are made in sections 12 x 12 x 2½ in. and are held in place by a special device. The tiling generally does not interfere with the removal of the tubes, but if it does may be itself removed. The tiling placed back of the middle bank of tubes rests on a cast iron angle bar supported by brackets built in the sides of the setting. The brackets, having pockets in them, permit changing the draft opening on this bank of tubes without disturbing the brickwork.

The manner of buckstaying and binding the furnace is shown in Fig. 1, but rather better in Fig. 5, which shows the fire arch in section. It will be seen that provision has been made to support it and prevent expansion.

#### Circulation.

The water circulation is from the lower drum up the front bank of tubes to the upper drum, where part of it is evaporated into steam and the remainder passes partly down the rear bank of tubes and a portion of the middle bank. It is kept in constant circulation while the boiler is in commission. The temperature of the gases in contact with the tubes is greatest at the bottom of the front bank and gradually decreases as the gases proceed, as indicated by the arrows in Fig. 3, between and along the tubes to the breeching. The rapid circulation secured tends to keep all parts of the boiler at uniform temperature, preventing severe stresses, due to unequal expansion, and it also permits quick raising of steam and rapid response to sudden demands on the steam capacity. This rapid circulation is promoted by the vertical position of the tubes and the fact that there is no restriction to the circulation, as each tube opens directly into the lower and upper drums without the intervention of headers, nipples or water legs.

In place of the brick setting the boiler can be furnished with a steel casing. For this no red brick is used, but a 9-in. firebrick lining is substituted. This lining is put in on an angle, the low side being next to the casing, thus preventing the brick from becoming displaced. This, with a small dead air chamber between the casing and the firebrick, reduces the losses by radiation and prevents the ingress of cold air.

#### British Iron and Steel Exports in 1909.

The statement of exports of iron and steel products from Great Britain in the first six months of 1909 shows a total of 2,083,135 gross tons of such products, apart from machinery, against 2,138,055 tons in the first half of 1908. The total values were £18,548,402 and £19,454,287, respectively. The exports of galvanized sheets show a considerable increase, having been 231,494 tons in the first half of this year, as against 192,118 tons. The exports of pig iron fell from 633,375 tons in the first half of last year to 536,174 tons. Rails show an increase of about 35 per cent., or from 216,909 tons to 287,549 tons this year. The rail exports to Argentina were an important factor in the increase, being 82,157 tons to June 30 this year, as compared with 38,584 tons in the first half of 1908 and 31,762 tons in the first half of 1907. British India was also a contributor to the increase in rail exports, taking 80,169 tons in the first half of this year, as against 60,870 tons in the first half of 1908 and 50,396 tons in the first half of 1907. The exports of rails to Australasia for the above periods were 42,586, 35,151 and 39,501 tons, respectively.

Canada, since her two mills became important producers, their production being reinforced also by imports from the United States, takes very few rails from Great Britain, the total for the first half of this year being 3281 tons, for the first half of 1908 2834 tons, and for the first half of 1907 1425 tons.



### A Rockford Heavy Duty Planer.

In the accompanying illustration is shown the Rockford 32 in. x 32 in. x 8 ft. heavy duty planer, manufactured by the Rockford Machine Tool Company, Rockford, Ill. The gearing in the drive is located inside the bed between the bearings. The bearings are long straight bushings accurately fitted into holes bored directly in the bed castings. Ample means are provided for perfect lubrication. The belt shafting device is very simple and reverses the table without shock or jar. The heads on the cross rail, also the side heads have both horizontal and vertical, as well as angular feeds. The down feed to the heads on the rail is 12 in.

The feed friction is of the combination releasing type. It will carry the heaviest feeds without slipping and will not run hot. The feeds are changed by the knob shown on the front of the friction, a pointer indicating the feed obtained at the different settings. With this device the feed can be changed for the finishing cut after roughing a piece of work and returned for the next casting, and the operator will know exactly what feed he is going to get without making several adjustments, counting the clicks of the ratchet, &c.

The different parts of the machine are very accurately fitted and are interchangeable. Side heads can be furnished at any time after the machines leave the factory. Ample means are provided on all bearings for adjustment for wear, taper gibs being used throughout. All bevel gears, pinions and feed racks are made from open hearth bar steel.

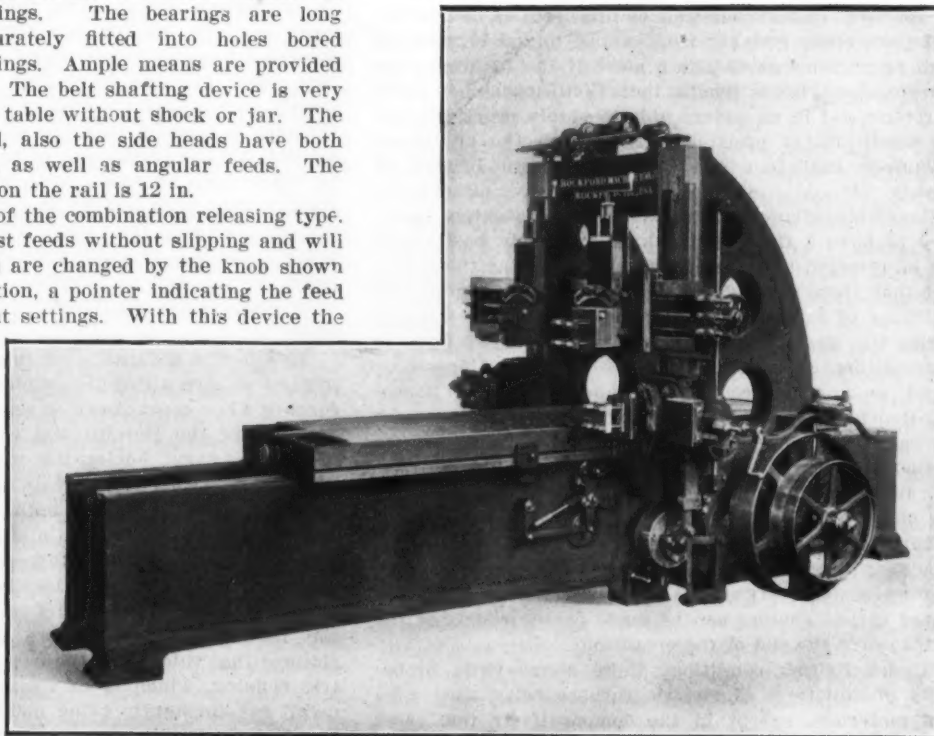
This company builds the well-known line of Rockford shapers. It has for some years been turning out planers in the smaller sizes and is now making rapid progress in developing a full line of planers, its aim being to build a rigid and powerful machine, at the same time maintaining the smooth running qualities and the ease of operation that have characterized its other tools.

**The Refined Iron & Steel Company's Plant to Be Sold.**—The plant and equipment of the Refined Iron & Steel Company, located on the Pittsburgh & Lake Erie Railroad, near Pittsburgh, will be offered for sale September 1 at 10 a.m., by Meyer Streng, N. S., Pittsburgh, receiver. The plant is practically new, having been operated less than 18 months when the company suspended. The site comprises seven acres, on which are six buildings containing three heating furnaces, seven puddling furnaces, a 22-in. muck mill, three finishing mills (16, 12 and 9 in.), two 1000-hp. Hamilton-Corliss engines, 10 other engines, an electric conveyor, three Epping-Carpenter water pumps, machine shop equipment, railroad sidings, tanks, fans and fan house, &c. The terms of sale require 25 per cent. of the purchase price as cash.

The Wheeling Metal & Mfg. Company, now located at Twenty-eighth street, Wheeling, W. Va., is building a new plant at Glendale, near Wheeling. The main building is of steel and brick construction, 80 x 280 ft. The Architectural Iron & Wire Works, Wheeling, is erecting it, as well as placing the concrete foundations for the second building, 60 x 140 ft., to serve as a warehouse. Most of the new equipment has been purchased except a gas engine and some electrical apparatus. The new plant will be ready for operation about October 1, when it will about triple the company's capacity for making stamped roofing, ceilings, &c.

### A Jeffrey Storage Battery Car.

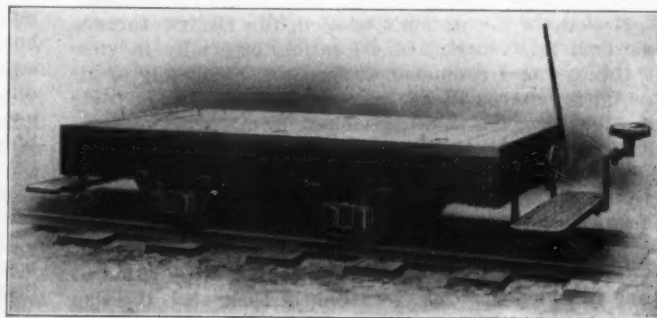
The illustration shows a new yard car just brought out by the Jeffrey Mfg. Company of Columbus, Ohio. The electrical equipment, including storage batteries, mo-



Heavy Duty Planer Built by the Rockford Machine Tool Company, Rockford, Ill.

tor, controller, with all necessary charging instruments, is located below the platform so that the truck can be used for carrying material of any kind, or for hauling yard cars. The design is such that it can be used on any gauge from 18 in. up, and on the shortest curves encountered on industrial tracks.

The electrical equipment is furnished in sizes to suit



A New Storage Battery Car Made by the Jeffrey Mfg. Company, Columbus, Ohio.

the service. For loads up to 10 tons, a 6 hp. motor with 10 kw. battery is provided. For heavier service, larger motors and batteries are supplied, depending on the maximum loads and the frequency of the trips. The platform is made removable allowing easy access to the electrical equipment. For the service usually encountered around the average manufacturing plant, moving raw material, castings, &c., the 6 hp. equipment will operate two or three days on a charge. By estimating the average weight and average length of trip, the proper size equipment can be determined. The use of these cars facilitates the handling of material around a manufacturing plant, and is claimed to effect a material saving in the cost of this work.

The centenary of the Friendly Society of Iron Founders of England, Ireland and Wales was celebrated recently, this being the iron molders' union of Great Britain. The corresponding union of the United States is just half as old, having been established in 1859.

## The Electric Refining of Steel\*.

### Its Place in the British Iron Industry.

BY F. W. HARBORD.

Where pure materials can be procured, as in Sweden, and pure scrap and pig iron can be mixed together in such proportions as to give a steel of the required composition, the original Kjellin induction furnace has much to recommend it, as we are able to obtain practically all the conditions of crucible melting with the additional advantage that tons can be melted down instead of pounds. If, on the other hand, our raw material is ordinary miscellaneous scrap, then it is absolutely necessary to have a furnace in which extremely basic slags can be retained in a state of fluidity to refine the metal, and that these slags can be removed when desired and additions of basic materials made to form new slags to purify the steel completely. In such cases we have to select either a resistance furnace, like the Héroult or Girod, an arc furnace like Stassano or the new Roechling-Rodenhauser induction furnace. All these furnaces are capable of making steel of the highest quality from common scrap; the high temperature obtainable and freedom of steel from oxidation give exceptional fluidity to the metal, which is particularly suitable for the manufacture of sound castings, and all these furnaces have been very successful in the production of castings from practically dead soft steel. If desired, ingots of any required carbon content can be made by recarburizing the bath toward the end of the operation.

Under British conditions there seems little probability of any form of electric furnace being used with cold materials, except in the comparatively few cases where it is employed for melting Swedish scrap for the production of high class tool steel, and it is as a refiner for ordinary Bessemer or open hearth steel that the electric furnace is likely to be of interest to British steel manufacturers.

At best the electric furnace is a dear melter, especially so in this country, where the cost of producing electric energy must always be comparatively high; but it is an economic refiner at those high temperatures, when the reaction between the slag and the metal is most effective. It is, therefore, as a refiner for ordinary steel that, in the author's opinion, the electric furnace is worth most careful consideration, especially in view of the fact that a number of furnaces, practically of all the types referred to, are now at work in different parts of the Continent treating molten metal, and it is reported that the United States Steel Corporation has just arranged for the erection of two 15-ton Héroult electric furnaces to refine Bessemer steel. The method of procedure is to take molten steel either from the Bessemer converter or open hearth furnace and transfer it to the electric furnace. Lime, with a little oxide of iron, is added to form an extremely basic slag, the slag toward the end of the operation being maintained as free as possible from oxide. Under these conditions in about 2 hr. almost complete dephosphorization and desulphurization take place, the final product containing in many cases only traces of phosphorus and sulphur, and what perhaps is more important in some respects, it is almost completely deoxidized. This latter is facilitated in some cases by the addition of ferrosilicon to the bath, the silicon being afterward largely removed from the steel.

#### Cost of Electric Refining.

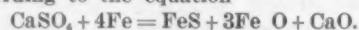
The cost of refining, of course, varies with the degree to which it is carried, and with the size of the furnace, &c.; but the consumption of energy for the complete refining of ordinary Bessemer metal does not exceed 300 kw. hours per ton of steel, and for many purposes 120 to 150 kw. hours is said to be sufficient. Taking electric energy at 1 halfpenny per unit for complete refining, after making reasonable allowances for repairs, wages, &c., the costs should be under £1 1s. per ton, and for

many purposes an expenditure of this kind would be fully justified to obtain an exceptionally pure material. Eight-ton furnaces working on these lines are refining from 100 to 130 tons of steel in the 24 hr. when producing what may be termed second quality electric steel, and from 50 to 60 tons when producing high grade steel of exceptional purity. One Roechling-Rodenhauser furnace has been making rail steel in Germany for rails subjected to exceptionally hard wear, and I am informed that other furnaces have been doing the same, which clearly shows that the cost of refining is not excessive. Without suggesting that the electric furnace should be utilized for the production of rail steel, there are many purposes, such as axles, tires, springs, &c., for which a steel of very high quality is required, which at present can only be made from expensive pig iron of the highest quality, and it is probable that such steels could be made more cheaply and of superior quality by refining ordinary open hearth or Bessemer steel in an electric furnace.

In selecting a furnace for this purpose it is extremely difficult to give a definite opinion as to the best type of furnace. For convenience in repairs, resistance electrode furnaces of the Héroult and Girod type have much to recommend them, but on the other hand an arc furnace like the Stassano has certain advantages, as the electrodes, not touching the bath, do not occupy such a large space in the furnace and are out of contact with the metal. Lastly, the three-phase induction furnace offers the advantages of no electrodes at all, but one would anticipate that repairs to the hearth and walls of the furnace would be more difficult, although it is claimed that this is not the case. In a process like electric refining, which is in its infancy, improvements in detail are constantly being made in the construction of the furnaces, and any one seriously considering the question should send his own expert to examine each process before coming to any decision as to the type of furnace to adopt.

#### Chemical Reactions in the Furnace.

Before leaving the question of steel refining, it may be desirable to consider the chemical reactions in the furnace and the reasons why the impurities are so much more completely removed than in the basic open hearth. For all practical purposes the electric furnace is a basic open hearth furnace, the only difference being that a much higher temperature is obtainable and no combustible gases are passing through the furnace, and consequently a neutral or nonoxidizing atmosphere exists during the whole operation. So far as the removal of phosphorus is concerned, the slightly oxidizing slag, combined with its high basicity and the fluidity which can be maintained by the high temperature, is sufficient to explain its complete removal, and to some extent the same applies to the removal of sulphur, but it does not entirely account for the latter. It is well known in basic open hearth practice that sulphur, especially when it is desired to remove it to below 0.05 or 0.04 per cent., cannot be eliminated until the end of the operation, and the necessary conditions are a nonoxidizing basic fluid slag; the lower the percentage of oxide of iron and the higher the percentage of lime the more completely is the sulphur removed. The elimination, however, is limited by the difficulty of maintaining a highly basic slag of sufficient fluidity, free from oxide of iron, and, further, by the fact that sulphur is liable to be taken up from the gases in an oxidizing atmosphere to be oxidized into calcium sulphate, when it may pass back again into the bath of metal according to the equation



The sulphur in the metal is present as sulphide of iron dissolved in the steel, and its removal in combination with calcium as calcium sulphide is not an oxidizing reaction like the removal of phosphorus, but a reaction taking place under reducing conditions; hence the presence of a reducing agent facilitates, while the presence of oxides of iron retards its removal.

The removal of sulphur in the Héroult furnace has recently been investigated by Dr. Th. Gellenkirchen, and he explains it as due to the action of the carbide of calcium formed in the slag, which by its reducing action

\* From a paper read before the West of Scotland Iron and Steel Institute.



first deoxidizes the metal and reduces the oxides in the slag and then removes the sulphur according to the following equation:



In the Héroult or similar type of furnace the high temperature enables slags of almost any degree of basicity to be maintained in a state of fluidity, and slags containing 63 to 65 per cent. of lime and 1 per cent. of iron are not uncommon, while the atmosphere is practically neutral, and there can be no doubt that carbide of calcium is produced in the slag, so that we have all the conditions essential to the removal of sulphur, and the above explanation seems to accord with the facts.

Although the above may explain the sulphur removal in electrode resistance furnaces, it cannot be suggested that carbide of calcium is formed in the induction furnace, and as its removal is equally complete, the conditions of its removal require a little consideration.

Professor Osann has very carefully investigated this question, and he at first tried to remove the sulphur by an extremely basic slag thinned with fluorspar; but this was not successful to the extent required, and he soon found to reduce the sulphur to 0.01 per cent. or less it was necessary to add some powerful reducing agent to remove the oxides in the slag. In the first case carbon was added to carburize the metal and reduce the oxide of iron in the slag, but this was not found to be efficient, and finally small quantities of 50 per cent. ferrosilicon were added to the slag. The method of procedure is as follows: After the removal of phosphorus, the slag is poured off as completely as possible and a new slag made with lime and fluorspar. Ferrosilicon in pieces the size of an egg is added in sufficient quantity to give about 0.35 per cent. of silicon in the bath, and then small quantities of ferrosilicon broken to the size of peas are thrown into the slag until it is white and shows by its color on sampling that it is free from iron, by which means the sulphur can be reduced from 0.06 or 0.07 per cent. to 0.008 per cent. The use of ferrosilicon has the advantage that its oxidation at the expense of the oxide of iron produces considerable heat and raises the temperature of the hearth. The reducing conditions may be assisted by additions of carbon powder as well as silicon.

Professor Osann considers the presence of oxide of iron in the slag prevents desulphurization because of the reaction  $\text{FeO} + \text{CaS} = \text{FeS} + \text{CaO}$ , which is a strongly exothermic reaction, or reaction attended with considerable evolution of heat. It is of considerable interest to note that two quite independent investigators working under different conditions have both arrived at the same conclusions as to the essential conditions of desulphurization, although the particular means employed to produce those conditions were different in each case, and as their investigations are very largely confirmed by ordinary basic open hearth experience, in the author's opinion there is little doubt as to the general soundness of the deductions drawn.

It must be remembered that the addition of reducing agents to the slag is only possible after the removal of the phosphoric slag, as otherwise the phosphorus would be reduced and pass into the metal, and hence it would be difficult to apply these methods of desulphurization in the basic open hearth process as worked under ordinary conditions.

#### Electric Smelting of Iron Ores.

From the British standpoint the direct smelting of iron ores in the electric furnace is of little practical importance, as, although considerable advances have been and are being made, the conditions existing in our country are such that the electric furnace cannot compete with the blast furnace. In countries which have no suitable fuel for blast furnace work, but have large ore deposits and cheap water power, such as Canada, many of the South American Republics and countries similarly situated, the position of direct smelting is different and the gradual developments are being watched with the greatest interest. Since the experiments made in Keller

furnaces at Livet by the Canadian commission demonstrated that all grades of pig iron could be produced at quite a reasonable cost various experiments have been carried out in different countries and much useful information has been obtained.

Stassano, in his arc furnace, some years ago succeeded in making not only pig but also steel direct from the ore, and claims that with pure ores such as he can obtain in Italy he can produce steel of any required grade by carefully mixing the ore with suitable fluxes and varying the quantities of carbon.

In 1906 the Canadian Government voted \$15,000 for experiments on electric smelting. These experiments were carried out under the supervision of Dr. Haanel at Sault Ste. Marie, Ont., and full details have been published in a special report. The primary object of the experiments was to determine if the Canadian magnetites and also certain ores existing in large quantities and containing considerable percentages of sulphur, but no manganese, could be smelted to produce pig iron of high class quality; also if charcoal and peat coke could be used as the reducing agent. The results showed that magnetites could be readily smelted and that a low sulphur pig iron could be produced from high sulphur ores. Both charcoal and peat coke proved satisfactory reducing agents, as a substitute for coke, and a pig iron of good quality containing only 0.43 per cent. of titanium was produced from titaniferous iron ores containing 17 per cent. of oxide of titanium. This last point may have far reaching results on the future developments of electric smelting, as not only does it make available all the titaniferous iron sands of the St. Lawrence River, but those of New Zealand and many titaniferous iron ore deposits quite useless for the blast furnace.

#### A Problem for the Electrical Engineer.

It will thus be seen that so far as the metallurgy of iron smelting is concerned the position is fairly clear, but a furnace is required which is capable of continuous working and dealing with fairly large quantities of material. Any furnace of the Keller or vat shaped type must necessarily offer considerable difficulties in charging, wear and tear on electrodes, &c. What is required is a furnace capable of continuous working in which the electrodes shall, as far as possible, be protected from the mechanical chemical action of the oxides charged and also the action of the gases produced. In any form of electrode furnace in which  $\text{CO}_2$  is produced from reduction of oxide, the consumption of the electrodes by the action of this gas must be very considerable. Therefore the future developments of direct smelting practically depend upon the electrical engineer, and it is for him to design a furnace which, from a mechanical and electrical point of view, is efficient. That the problem is worth the serious attention of electricians is shown by the great number of inquiries one receives from all parts of the world, and the author knows a number of people who would at once consider the question of putting down small smelting plants in districts where blast furnaces are impossible, provided he could assure them that a suitable furnace had been designed which was giving good commercial results. A large output is not necessary, and in many cases a furnace producing 100 tons per week would suit the local requirements and conditions in out of the way countries better than the large productions of a modern blast furnace.

The more recent experiments by the Grondal Company in Sweden, upon which a great deal of money has been spent, are very promising, and the author has been shown in confidence particulars of a furnace which, so far as one can judge from a sketch and results obtained, certainly looks very promising. He hopes later in the year to see this furnace at work, as directly the winter is over the water supply will be available and they will restart operations.

In direct smelting experiments, working under regular conditions for the production of pig iron, it is not safe to assume a consumption of less than 1700 to 1800 kw. hours per ton of pig iron produced, but where water power is available and electric energy can be cheaply



produced this should not be prohibitive under those conditions where electric smelting is possible.

#### **Ferrosilicon and Ferrochrome.**

The large number of alloys now being produced in the electric furnace and the large extent to which they are now being used by our steel works make their production both of practical and theoretical interest to all those interested in steel manufacture. The two alloys which are most largely consumed are ferrosilicon and ferrochrome. Ferrosilicon above 15 per cent. cannot be produced commercially in the blast furnace. Probably 10 per cent. is about the limit, and consequently for alloys varying from 25 to 80 per cent. we have to rely upon the electric furnace.

There are two methods of producing ferrosilicons, one by the direct reduction of iron ore and silica with carbon, the carbon being supplied to reduce the silica to silicon, which is absorbed by the melted scrap iron. This latter is the method employed by Keller at Livet, where they produced large quantities of ferrosilicons of all grades from 25 to 80 per cent. A silico-manganese containing 68 per cent. of manganese and 25 per cent. of silicon has recently been produced by Gin from manganese silicate, and this is an alloy which for certain purposes may prove very useful to steel makers. To obtain an alloy of this class, low in carbon, ferrosilicon is made in one furnace and ferromanganese in another, and then the two are run together into a common receptacle, when the silicon in the ferrosilicon displaces the greater part of the combined carbon in the ferromanganese, causing it to separate out as graphitic carbon, which rises to the surface of the bath of metal and can be brushed off when the alloy is cold.

Ferrochrome has been made in the blast furnace up to 60 per cent., but then contains 12 per cent. of carbon, and for practical purposes the blast furnace limit may be said to be about 40 per cent. chromium. Considerable quantities of this alloy, containing 60 to 70 per cent. of chrome and 6 to 9 per cent. of carbon, are now produced in the electric furnace, the conditions being similar in many respects to those required for the production of pig iron, but a higher temperature is required to insure reduction. Low carbon ferrochrome with less than 4 per cent. carbon is also made at several works. The details are kept secret, but the carbon is probably oxidized by using a large excess of chrome ore. An exceptionally low carbon ferrochrome containing 1 per cent. or less of carbon is produced by the Société Néo Metallurgique in the Giffre furnace, and this is used especially for the manufacture of chrome and tungsten tool steels. This company makes a specialty of producing a large number of low carbon alloys. The details of manufacture are not known, but it is claimed that the results are largely due to the special Giffre furnace which is employed. Nickel ferroalloys, ferrotungsten, ferromolybdenum and other alloys of very varying composition are now all being produced. The above alloys, with the exception of the very low carbon ones, are produced in almost all the forms of furnaces described in this paper.

#### **The Electric Furnace in Great Britain.**

Unfortunately, so far the electric furnace has made little headway in this country, and both in steel manufacture and steel refining, and the manufacture of alloys, we have been left far behind by our Continental friends. This is, no doubt, largely due to the cheap sources of electric energy available on the Continent. It must be remembered, however, that in very many cases the advantages gained by cheap water power are very seriously counterbalanced by the inaccessibility of the works and consequent increased cost of transit; it not infrequently happens that many works have to stand idle for 5 months out of the 12, owing to the lack of water, and although when running the cost of energy may be extremely small, this standing idle for a considerable portion of the year is a serious set off against the low running costs.

Although we have little cheap water power, in cases where waste gases from blast furnaces or coke ovens are available, combined with the other great advantages

of cheap transit and a ready market for our product, we should in some cases at least be able to hold our own with our Continental competitors. This is certainly true so far as steel refining is concerned and, in some cases, as regards the production of ferrosilicon and similar alloys.

According to this, from gas engines it is possible to develop a kilowatt year at £7, and many engineers estimate it at very considerably less than this, especially when by-products are allowed for, and in any case where blast furnace gases are available the fuel costs would be considerably reduced, and an approximation to the costs of water power (when the capital expended on development does not exceed £30 per electric horsepower capacity) should be obtained, which would probably make the production of ferrosilicon distinctly profitable.

#### **A Saving on Crucible Steel.**

Considering the whole subject in the light of recent developments, the author is of the opinion that steel, equal in all respects to the best Sheffield crucible steel can be produced in any good type of electric furnace at considerably less cost; that steel of the very highest quality, exceptionally low in phosphorus and sulphur, and distinctly superior to ordinary open hearth metal, can be produced by refining either Bessemer or open hearth steel at a very small cost, and that, by carrying the process of refining still further, at a very small additional cost steel equal to crucible steel can be obtained. Further, under favorable conditions as to cost of raw materials, especially if a surplus of blast furnace gas is available for generating electric energy, ferrosilicon and similar alloys can be produced at a cost to compare favorably with imported material produced from water power.

With regard to pig iron, this can be produced of any grade and of satisfactory quality, but the electric furnace cannot compete commercially with the blast furnace under the conditions existing in this and other countries, where fuel is cheap, though there is a considerable field for its development in countries where cheap water power is available, and where, owing to suitable fuel for the blast furnace being unobtainable, and other conditions, the latter is impossible. Even with existing furnaces, under special conditions it might be possible to produce pig iron commercially, and in the near future, with the gradual improvements in furnace design which are taking place, we may anticipate that in the countries referred to electric smelting of iron ores will become an established industry. At the same time it cannot be too strongly borne in mind that the conditions for the commercial production of pig iron are confined to special cases, and no general opinion can be given. Only when all local conditions, both as to the cost of power, raw materials, labor, &c., as well as the class of product required and the market for the finished material, have been most carefully investigated can a sound opinion be given as to its commercial feasibility.

Work has been started on the development of the Isabella Connellsville Coke Company's \$7,000,000 tract. The company owns 3000 acres, and the new plants will be located near Arnesburg, Fayette County, Pa. George S. Baton of Pittsburgh is the engineer in charge of the work. The main line of the Monongahela division of the Pennsylvania Railroad will be changed to take in the new plants, which will have a yearly capacity of about 1,200,000 tons of high grade coke. There will be 1600 ovens in the first contract, and the capacity of the plant will be extended gradually.

The second annual Industrial exposition of the manufacturers of Buffalo, under the auspices of the local Manufacturers' Club, will be held October 6 to 16, inclusive, in the Broadway Armory, and gives promise of being about two and one-half times as large as the very successful exposition held last year in Convention Hall. The electrical decorations will be a special feature, requiring 60,000 lamps for the interior and exterior display.

A New Double Acting Press.

The Queen City Punch & Shear Company, Cincinnati, Ohio, has brought out the new double acting press herewith illustrated, a patent on which has been applied for. It is designed for the purpose of forming and pressing a variety of work in sheet metal and is regarded as especially suitable if a large quantity of such work is to be done. The illustrations show a front and a rear view of the machine. The special features are the oscillating table and the manner of operation by which the workmen are protected against injury to hands or fingers, whereas under the ordinary system there is constant danger, while actively feeding and removing the work. Two operators are required to feed and remove work, one looking after the front and the other the rear.

The plunger or ram, as shown, is in the down position and the front die is out. This is the proper position of the die when fixed in position and without motion. While the plunger rests thus, the front operator is removing the finished work and placing a blank in its stead. The plunger then rises and the die moves to a position under the ram, so that the blank can at the next downward stroke of the ram be formed or pressed to shape. While the freshly inserted blank has been assuming the position described, the rear die has been

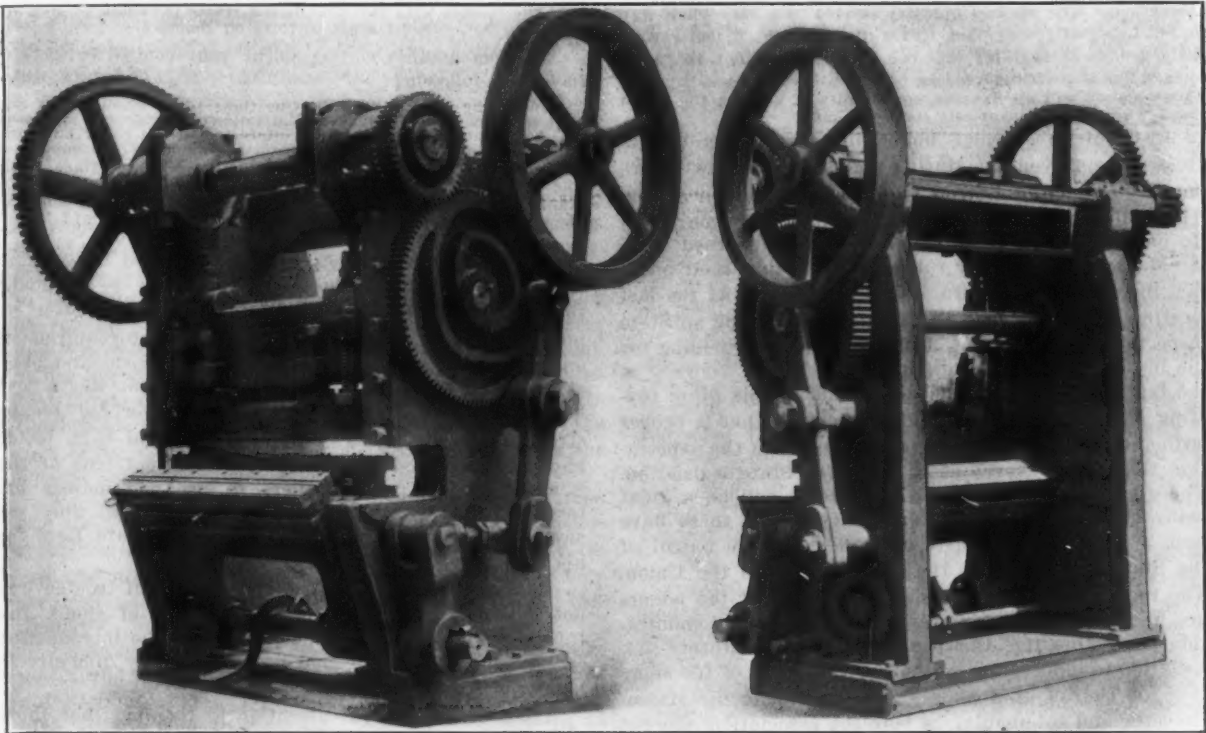
Electric Smelting in Sweden.

In the London *Iron and Coal Trades Review* are given the following results of tests made in the electric smelting of Tuollavaara ore from Lapland at the well-known Domnarfvet Works in Sweden. The furnace was of the Acktiebolag Electrometal design, and the report of the tests was made by Filip Freden, chief engineer, in the interest of the Starfors Acktiebolag. Metric tons are represented by the figures and horsepower is 0.746 kw.:

The ore showed the following analysis: Fe<sub>2</sub>O<sub>3</sub>, 1.9 per cent.; Fe<sub>3</sub>O<sub>4</sub>, 93.5 per cent.; MnO, 0.1 per cent.; CaO, 0.6 per cent.; Al<sub>2</sub>O<sub>3</sub>, 2.0 per cent.; SiO<sub>2</sub>, 1.8 per cent.; Fe, 68.9 per cent. The tests were carried on from June 26 to July 5 last. The total time occupied was 219 hr. During this time the current was turned off for 16 hr. on account of defects in the machinery, change of an electrode, &c., leaving an actual smelting time of 203 hr. The charges were as follows:

Tuollavaara ore.	Coke.	Charcoal.	Limestone.	Number of charges.
Kg.	Kg.	Kg.	Kg.	
100	11	11	4	149
100	12	11	4	181
100	8	15	4	156
100	8	17	4	56
100	7	17	4	75

Total number of charges.....617  
The total amount of material used was as follows:



The New Queen City Double Acting Press Made by the Queen City Punch & Shear Company, Cincinnati, Ohio.

brought before the other operator, who is then engaged in removing the finished work and replacing it with blank. In this way the operators have no occasion to place the hand or fingers under the press, thereby avoiding danger of accidents. This is a very important feature to large establishments which, it is emphasized, are continually liable to injuries sustained by workmen operating machines built in the usual manner.

The machine runs continuously, but it is provided with an automatic safety stop clutch by which either of the operators can stop the machine at will. The speed of the machine is governed by the character of the work to be done and the rapidity with which the operators can handle it. More than double the amount of work can be done on this machine than on the ordinary press, it is stated, with the particular advantage of absolute safety to the operators. The machines are equipped with machine cut gears and can be driven from a belt or by direct motor attachment. The machine illustrated is 36 in. between the housings, is 6 ft. high, and weighs 7300 lb. The floor space occupied is 4 x 5 ft. Other sizes can be built as desired; and for any class of forming or pressing.

Ore, 61.7 tons; limestone, 2.468 tons; coke, 6.032 tons; charcoal, 8.197 tons; electric energy, 112,109 kw.-hours, or 17 hp.-years. The output of pig iron was 43.5 tons, with a carbon percentage varying from 2.33 to 3.09, and with a white structure. The percentage of iron to ore was 70.6. Per ton of pig iron there was used: Electric energy, 0.39 hp.-year; coke, 0.139 ton; total coal, 0.327 ton; charcoal, 0.188 ton. The coal used was of a rather poor quality, the tests showing percentages of carbon from 0.65 to 0.75 in the charcoal and 0.8 in the coke.

The pig iron smelted per horsepower-year was 2.56 tons, and the production in 24 hr., 5.15 tons. The total amount of slag was about 7000 kg., containing from 1.59 to 4.25 per cent. of iron. The average of the analysis made showed 2.95 per cent. The amount of iron in the slag thus was about 0.0295 x 7000 = 206.5 kg., or 0.47 per cent. of the iron produced. Most of the iron in the slag was metallic. The consumption of electrodes was judged from the two electrodes last exchanged which had been in 22 and 30 days, respectively. It was 9 kg. per ton of pig iron. The average power used was about 550 kw., at a voltage of 44, and an amperage of 8300, giving a power factor of 0.87.



## The American Boiler Manufacturers' Association.

Detroit Meeting, August 10 to 12, 1909.

The twenty-first annual meeting of the American Boiler Manufacturers' Association was held in the Pontchartrain Hotel, Detroit, Mich., August 10, 11 and 12. The proceedings were opened by Col. E. D. Meier, president of the association, who called the convention to order, expressing his gratification at the excellent attendance. Mayor Philip Breitmeyer was introduced, and made a most appropriate address of welcome. Colonel Meier responded in behalf of the association, making an address replete with facts bearing upon the early history of Detroit and giving many of his hearers information which was either new to them or had been forgotten. In the course of his remarks, prompted by the fact that his own interests are so closely identified with St. Louis, he said:

We like to get to Detroit on account of our Canadian friends. It is a good central place to come, and you have arranged for the best weather. Now there is another reason: Detroit has taken away from the city of St. Louis one of the most important industries that originated there, the making of air tools. This industry was taken away from St. Louis by two energetic sons of Detroit, the Duntleys, who have built it up into tremendous proportions. The air tool industry started in a very small way in St. Louis originally, but to-day there is not a boiler shop that amounts to anything that can get along without air tools; so that this is a veritable Mecca for the boilermakers to come to. I presume we will all have an opportunity of visiting the grand shops where these pneumatic tools are made.

J. C. McCabe, chief boiler inspector, Detroit, addressed the convention, stating that there are now before the City Council of Detroit two proposed ordinances covering boiler inspection, widely different in their character. He has recommended for adoption rules patterned after the Massachusetts boiler rules, believing that their adoption in toto will be desirable and advisable. At the last meeting of the Michigan Legislature, there being no State inspection law at present, a bill was passed providing for the inspection of all boilers on inland lakes. In view of the fact that no legislation now exists in this State covering land boilers, it is highly important that a proper ordinance be passed by the city of Detroit in the expectation that it may serve as a model for State legislation. There are in Michigan some 9000 steam boilers, a great many of which are of antiquated type, and there have been a great many disastrous explosions, the record of the State being perhaps the worst of any in the Union. The records show that less than one-half of the boilers are inspected. He later presented a written communication requesting the American Boiler Manufacturers' Association to indorse the movement in support of the adoption for Detroit of a code of rules following the Massachusetts, and by unanimous vote the association adopted a resolution accordingly. It is expected that the Governor of Michigan will shortly appoint a commission to report on the advisability of State wide inspection laws.

W. H. S. Bateman, secretary of the associated members' organization, announced the various entertainment features for the period covered by the meeting. These were comprehensive and most attractive.

### The Topical Questions.

J. Don Smith, chairman of the Committee on Topical Questions, submitted his report as follows:

1. Why is it required to use heavier heads in boilers for Western rivers than on the Atlantic coast?
2. What is the best method of keeping water in circulation in corrugated furnace boilers?
3. In return tubular boilers made in more than one sheet, which is the best practice, to make the lower half in one sheet or have a girth seam, this being clear of the direct action of the fire?

The last mentioned subject was brought up at our Cleveland meeting, but we think it should be discussed again, as we have since taken in a number of new members, to whom it may be of interest, and who may give us some valuable information. To open the subject, some years ago we built a battery of return tubular boilers, 60 in. in diameter. After running several years the furnace of one of the boilers came down from the effects of scale or oil. In my opinion, had the boiler been built with the bottom half in one sheet

an explosion would have occurred, the only thing preventing that being the girth seam. The largest bulge was in the front sheet, the seam being intact, while the second bulge started just back of the seam; the seam held, but opened enough to let water out over the fire. I would like to hear from the members along this line.

4. As opening up an interesting matter for discussion your committee invites attention to the matter covered by a letter received, from which the following is an extract:

We have some interesting experiences in the proper heating of boiler rivets with oil. We use the Tate-Jones oil rivet heating furnace, Chambersburg riveter and Champion rivets, all good goods, but after having been very successful for years making tight rivets, all at once we seem to have from some cause lots of leaking rivets, causing lots of trouble. We took it up with Tate, Chambersburg and Champion. Mr. Champion very kindly sent us a book he had had compiled by several boiler men, being a special prize letter on the subject, and after reading up thoroughly and testing several pieces of work we became convinced that the trouble was too high air pressure, the bridge wall in the oil furnace having burned down so that the air blew directly on the rivet, and overheating caused a scale, so it was almost impossible to get tight rivets. Our foreman had decided that he must go back to heating with coke; but after reducing the pressure to, say, 8 to 10 lb., and replacing the bridge wall in the Tate oil furnace and heating the rivets only to a cherry red, not white heat, we got good results and recently riveted two 84 in. by 20 ft. high pressure return tubular boilers with not a leaking bull rivet at 260 lb. We feel satisfied that more than half the trouble with machine driven rivets is caused by heating them too hot, causing scale to form on the rivets.

5. From another correspondent your committee has received the following:

Under the head of Topical Questions to be discussed at our next meeting I would suggest the following, which if discussed will be of interest to everybody interested in the boiler business, either in the manufacture of steam boilers or in the supply of material for them: "Has the introduction of gas engines, gasoline engines, water power plants and central electric power plants reduced the number of steam boilers in service, and has the demand for steam boilers decreased on this account?"

### Discussion of Question 1.

The discussion of question 1 was opened by Captain Rees of Pittsburgh, who stated that the  $\frac{1}{2}$ -in. heads formerly employed on 40-in. boilers had now been replaced by  $\frac{5}{8}$ -in., which is the Government requirement on Western rivers, and nothing less will withstand pressures of 200 to 215 lb. of steam. He said he was a firm believer in the United States laws governing tensile strength and thickness of boilers. The old  $\frac{1}{2}$ -in. heads had to be patched frequently, which is not true of the  $\frac{5}{8}$ -in. now used. The boilers in use are mainly externally fired, two, four, five, six and seven flue, the seven-flue being the type preferred by Captain Rees for his own use.

Captain Brobst, Bay City, Mich., asked if trouble was not experienced with unequal expansion of shells and tubes? Captain Rees replied that since the introduction of machine flanging he had not noticed any difficulty in his practice.

Colonel Meier called attention to the fact that those not familiar with Western river practice would, no doubt, find difficulty in realizing the extremely hard service to which boilers are subjected there under the high steam pressures that obtain. The boilers are worked as hard as those on torpedo boats, good free burning coal being consumed at the rate of 50 lb. per square foot of grate surface per hour, with forced draft.

### Discussion of Question 2.

Taking up question 2, H. J. Hartley of Wm. Cramp & Sons, Philadelphia, said there were many ways of accomplishing this end. One is to place a jet of steam in the boiler bottom; there is also an instrument called a hydrokineter that is something like an injector and used as the boilers are being fired up, and as soon as the temperature becomes uniform in the top and bottom of the boiler its use is discontinued for the time. It is most important to get the circulation properly started at the outset of raising steam, and it can then be more easily maintained afterward. If a reasonably uniform circulation is not maintained there is bound to be unequal expansion of the sheet and liability to leakage as a result. This leakage is more apt to occur at the curvilinear seams. Few Scotch boilers are constructed with such seams, and with boilers having such seams double riveting or triple riveting generally cures the



trouble complained of as to leakage. While the difficulty has been largely provided for, especially in Scotch boilers, yet the subject of circulation is one that should always receive careful attention on the part of the engineer. This is often done with a donkey boiler.

Colonel Meier referred to the fact that at the battle of Santiago, although the Navy Department had given orders not to attempt to raise steam in less than 6 hr. in the Scotch boilers, it was done in 3 hr., the risk being taken, and the boilers stood the strain. Mr. Hartley thought that if the fires were banked previously 3 hr. in such a case was sufficient.

F. B. Slocum of the Continental Iron Works, Brooklyn, said that with a Scotch boiler of the type made by them excellent results had been got as to circulation by the employment of a brick baffle arch placed at the back end of the furnace just before the combustion chamber, the object being to baffle the gases, compelling them to pass down and strike the bottom of the furnace before they pass out into the combustion chamber; also to contract the opening of the furnace mouth at the back end of the furnace. Experiments conducted not only on the Scotch, but other types, with the use of the baffle described and also without its use, showed conclusively its good qualities in distributing the gases and preventing excessive ash deposits, that insulate the boiler and prevent heat acting effectively. In some large installations the circulation is started with a pump that pumps into the bottom of the boiler, but this is not necessary, in the opinion of the speaker, where the baffle arches described are used.

John J. Main, Toronto, described a device consisting of a shaft let into the front end of the boiler, running through to the back end, with miter gears on the shafting and a vertical shaft from that extended downward near the bottom of the boiler, with a small propeller wheel placed on it about 10 in. in diameter, and a small crank on the shaft on the front end, making it possible to be operated by the fireman during the early stages of raising steam. These propellers agitate the water and create a circulation before the steam is raised. Being asked how he fed the boilers, Mr. Main replied that it was fed in the top, a pipe being turned down into the bottom of the boiler, then a nozzle turned up; the pipe is run down past the combustion chamber along the bottom and then turned up.

Mr. Ryan said he had experimented with the feed and used two feed pipes instead of one. On the lakes trouble is had with the pitting of bottoms of boilers below the fire line. The use of the two feed pipes constructed as described by the speaker had cured this difficulty.

Captain Rees said he had been working with baffle plates and was a great believer in them, but so far had not been able to find a metal baffle that would stand high heats. He had obtained the circulation desired by the use of a blow pipe going into the boiler first into the steam space between the flues.

Colonel Meier called the attention of Mr. Slocum to the fact that when working with Eastern coal he was under entirely different conditions from those confronting the Western river men, whose coal contains far more sulphur. Much of it contains what is called white sulphur by the engineers, a sulphate of lime that makes not a little complication when the coal contains iron pyrites; when that gets hot it will flux with the fire brick; that is especially the case on the Mississippi River.

Mr. Schaaf asked if he properly understood Mr. Ryan that he had not got any scale in his boilers in three years' use of the device described by him. Mr. Ryan replied that it made the scale soft so that it could easily be blown out; the water is passed through purifiers first, which are nothing but a common wooden box with three or four departments, into which steam is introduced and the water forced through; the boiler absolutely shines inside.

#### Discussion of Question 3.

John J. Main, Toronto, said that he built boilers with the girth seam clear of the bridge wall, probably due to the fact that he was unable to obtain plates large enough to make the boilers in one sheet, as the rolls were

not long enough to produce the latter. Mr. Wangler, St. Louis, thought it the better practice to employ a girth seam.

#### Discussion of Question 4.

An interesting discussion of some length followed on the merits of heating rivets by oil or otherwise.

C. J. Wangler, St. Louis, reported having had trouble with leaking rivets using oil furnace and had gone back to coal. Though it may be possible that the oil furnace may be so regulated as not to give trouble, yet with the class of men obtainable in many instances the regulating of the heat is more difficult to secure, and coal is preferable on this account.

Mr. Wangler stated that a certain scale was formed by this process in practice that gets into the die and cuts it to pieces; it seems to stay on the rivet and does not work out. The scale also gets into the crevice between the rivet and the sheet and prevents tight contact.

Mr. Hartley stated that scale might be produced on rivets from many causes. It often occurs by having too many rivets in the furnace at one time. Scale generally forms when the furnace is idle waiting for rivets to be called for. If the temperature falls in the furnace scale forms immediately. For hydraulic machine work rivets should not be heated above a good bright red heat. He said that too much attention cannot be paid to the mode of heating, and also to the removing of the burr off the edge of the rivet holes. The burr holds the sheets apart and will allow some of the rivets to flow into the burr space. If water once gets under the rivet head it is apt to come through on the sheet. No imperfect rivets should be used under any circumstances. The removal of the burr described makes a perfect stop-water. Most specifications now prohibit calking, and in Germany they are very strict in this regard.

M. A. Ryan, Duluth, Minn., has for the past two years employed an air drill for removing burrs after the work has been drilled and then taken apart for this purpose. Since adopting this method he has materially reduced the percentage of leaking rivets. The Hartford specifications call for this work to be done, but at least 75 per cent. of the boiler manufacturers do not do it, but leave the butt straps on instead of taking them off and removing the burrs. In circular sheets especially the greatest necessity exists for taking this precaution. Put both heads in and countersink all holes and all trouble will be avoided. Holes of, say, 13-16 in. originally can be reamed to 15-16 in.

T. M. Rees, Pittsburgh, expressed his pleasure at having heard the discussion on this matter. His foremen had refused to use the oil, preferring coal, and he had thought maybe they were wrong, but the discussion has convinced him they were right. He had, however, seen the American Bridge Company getting good results by using a valve for regulating the air supply, thus enabling the workman to heat the rivets very uniformly.

Mr. Ryan said he had abandoned the use of air forges entirely, and with the hydraulic machine is using coke entirely.

D. J. Champion of the Champion Rivet Company, Cleveland, was asked to give his idea of the matter from a rivet manufacturer's standpoint, and said that the heating of rivets depended a great deal on the kind of tool used in driving them. He believed that the most successful heating was obtained with coal, natural draft, and high stack; the rivets must be heated to a cherry red, and never allowed to reach the point where they scale. When driven with pneumatic hammer they sometimes want to be white hot. In the little hand forges the men sometimes blow them up with compressed air, because it is so much easier to bring them to a certain heat that way; but if heated in a common sense way proper results will be secured. In reply to a query by Mr. Wangler, Mr. Champion stated that he used fuel oil low in sulphur. If rivets are heated with fuel high in sulphur bad results are produced by the sulphur being absorbed by the rivets.

John J. Main, Toronto, thought that it was more a question of temperature than kind of fuel; at a certain temperature the rivet is more apt to absorb the sulphur and form scale. When scale does form, notwithstanding

all precautions, the rivet may be dipped in a pail of water, and then the scale will drop off, or the rivet can be thrown aside and the scale knocked off at some convenient time. If rivets are heated too hot and driven too fast and put in hot they will afterward contract in the hole and become loose.

H. J. Hartley, Philadelphia, reported that he had experimented with all kinds of fuel, and had finally come back to anthracite coal. It produces a more even temperature, and the rivet comes out cleaner. The important matter is the removal of all the burrs around the hole. The sheet and the butt strap must be gotten to fit perfectly. It is necessary to take the butt straps off and thoroughly clean off the burrs as referred to by previous speakers. In using the hydraulic press a stream of water should be kept running on the rivet both inside and out, and then the workman can drive more; the water, if there happens to be a little scale, will knock it off.

At the Tuesday afternoon session John A. Stevens, member of the Massachusetts Board of Boiler Rules, representing the boiler users' interests, was introduced. He said the interests he represented had been most fairly treated by the board and had no complaint to make; that while some of the requirements had called for the expenditure of more money they were generally recognized as being for the best conservation of life and property. He offered any assistance he could render to the work of the American Boiler Manufacturers' Association.

Colonel Meier resumed the discussion of Question No. 3, calling attention to the fact that in steel the transverse strength of the metal is nearly as great as the longitudinal strength, although it has been recently stated that in testing steel both the transverse as well as longitudinal strength be tested.

#### Discussion of Question 5.

Mr. Scannell of Lowell, Mass., stated that there were not so many small upright boilers made and sold in his section as there were before the general introduction of electric power; electric motors are, in a measure, displacing them.

Mr. Connelly of Cleveland reported that in his section of country a good many gas engines and gasoline engines are being used. Gasoline road rollers are being used, and gasoline engines for mixing concrete, for which formerly boilers and steam power were used. He himself employs gasoline for obtaining air pressure for outside work.

Colonel Meier referred to the increasing use of large gas engines of several thousand horsepower in steel works. He said that the difficulty with gas engines at present is the regulation, but the time is fast approaching when this will be remedied. The United States tests at St. Louis of comparisons between steam engine and gas engine efficiencies had shown very good results on gas engines down to 1.7 lb. per horsepower, even 1.25; and the standby losses were not any larger in gas producer than in steam engine plants; 1.35 was a fair average of test results on standby losses. That cannot be had with the highest type of steam engine and very expensive plants. The main difficulty is to find a way to use bituminous coal to best advantage with gas producers; the best results have been obtained with coke and anthracite.

Mr. Connelly thought that not 25 per cent. as many steam boilers are used for drilling as there were 25 years ago. Gas engines are taking their place.

Mr. Scannell reported instances where gas engines were taken out and replaced by steam, those who did so having tried unsuccessfully to use illuminating gas.

Mr. Stevens said that aside from being more expensive than steam the gas engines were not so reliable, being irregular and not dependable, and the users got disgusted with them.

Mr. Houston of Cincinnati commented on the fact that in this country the economy of small steam engines has never been fully developed as it has in England by the use of superheating, equaling the best economy reached by any gas engines at present on the market.

Mr. Stevens corroborated this statement, and said that everybody on the other side of the water, where he had spent some months in studying the situation, was using

superheat to advantage down to the smallest sizes of steam engines. The superheaters are simply constructed, and there is no reason why a similar practice cannot be adopted in this country to great advantage.

George N. Riley of Pittsburgh inquired of Mr. McNeill whether in his experience he had found that boilers are diminishing and being superseded by other power?

Mr. McNeill replied that in the larger centers of population electrical power plants are furnishing power to many of the smaller manufacturing plants for motor driven machinery, where there is no necessity for using steam for mechanical purposes. On the other hand, the economical installation of steam plants is being made much more of a study than 10 years ago, and successfully so. Formerly it was no uncommon thing to see a steam plant being put in without any provision being made for the heating of the feed water, thus instituting a large element of loss. Under the careful plans now being followed, the steam plants must maintain their position for some time to come as being a reliable source of power.

In reply to a query by Mr. Connelly, Mr. Stevens said that the prevalent practice on the other side in the use of superheat was a series of tubes with smaller tubes inserted in them, the steam being passed through the smaller tubes; in the Galloway type boiler a simple steam drum or rectangular box and U tube running down past the end of the boiler. Europeans use all the superheat they can get in operating engines; the favorite type is attached to the boilers. The steam is taken out of the top of the boiler and exposed to the action of the superheaters, which are exposed to the flames direct.

Mr. Stevens stated that with internally fired boilers superheaters are installed which extend through the rear end of the combustion chamber, utilizing the gases after passing through the under part of the sheet. Automatic engines with automatic governors are coming into more general use. In saw mills these are used, burning refuse.

Mr. Connelly spoke of the difficulty experienced in early days in getting plate that would stand the heat of superheaters that were used in refining oil vapor, in order to take out the sulphur in the oil. He asked whether similar difficulty is not found to get plate that will stand the high heats of superheating.

Mr. McNeill replied that the Foster superheater has a series of steel tubes incased with cast iron rings that receive the direct impact of the gases, and the temperature of the internal pipes remains more constant with the furnace temperature of the gases passing up through the chimney, and the pipes under pressure are thus protected from direct impact with the gases by the cast iron sleeves. They claim they have never had any serious trouble; in fact, if one gives out a new one can be slipped in. In the water tube boilers the superheaters are put in the upper part and not exposed to as high temperatures. In a case that came up recently one of the rules formulated by the Board of Boiler Rules stated that where the temperature of the superheater is over 80 degrees all pressure parts should be of cast steel, and the contract called for superheat of a minimum temperature of 75 degrees and maximum, 105 degrees.

Colonel Meier suggested that the Board of Boiler Rules carefully consider the necessity, if any exists, of steel fittings, as if they are not necessary, it will save considerable outlay in a large plant.

George Wagstaff of the American Locomotive Equipment Company and Railway Exchange, Chicago, first president of the International Association of Master Steam Boilermakers, addressed the convention, appearing as a special delegate from that organization. He explained that his principal object was to ask the co-operation of the American Boiler Manufacturers' Association in forwarding the work of the International Association. He stated that the foremen who compose the International Association are doing good work; that their personnel and objects and work have become most creditable, and their technical discussions of a highly educational character. He believed that the manufacturers would benefit by encouraging them to attend the meetings and derive all the benefit they could from



them, which would react upon the improvement of the trade conditions generally. On motion of Mr. Riley the American Boiler Manufacturers' Association agreed to purchase copies of the proceedings of the International Association, sufficient to supply both their active and associate membership.

#### Appointment of Committees.

At a later session John J. Main was appointed a special delegate to attend the next year's convention of the International Association of Master Steam Boilermakers.

President Meier appointed the following committees:

On paper to be submitted by James Lappan in executive session, Messrs. Lappan, Ryan, Leonard, Munroe and Wangler.

On Boiler Inspection Laws, and particularly with regard to the local Detroit situation at this time, Messrs. Rees, Connelly, Main, Mackinnon, Hartley, Riley and Lappan.

On Time and Place of Next Meeting, Messrs. Wangler, Munroe and Main.

Auditing Committee, Messrs. Riley and J. Don Smith.

Nominating Committee, H. J. Hartley, Wm. Kehoe and A. J. Schaaf.

At the Wednesday morning session Commander R. S. Griffin, who had been especially delegated by the Navy Department to attend this meeting, made a brief address.

#### Uniform Boiler Specifications.

Colonel Meier, chairman of the Committee on Uniform Specifications, presented the report of that committee, which was adopted, as follows:

In our report of last year we gave you a report made by a committee of the American Society for Testing Materials (of which your chairman has also the honor to be chairman), recommending for their adoption the original limitations as to sulphur and phosphorus, as found in the specifications of the American Boiler Manufacturers' Association of 1889. This report was signed by the majority of the members of the committee, five in number representing steel users, while two of the members, representing steel plate manufacturers, refused to sign it and made strenuous opposition. This report was referred to the Committee on Steel Specifications of the American Society for Testing Materials, being Committee A. This Committee A met in Philadelphia March 1, 1909, to discuss the matter. Your chairman addressed a letter February 25 to this committee, which is hereto appended, as Exhibit A.

This report again had the assent of the majority of Committee R, but in spite of this Committee A has published specifications with the high phosphorus complained of and has even increased the permissible percentage of sulphur. This action was taken in spite of the strenuous protest of Henry J. Hartley, one of the original members of your committee. Your chairman, therefore, addressed a strong protest to the American Society for Testing Materials at its convention in July of this year, copy of which is appended as Exhibit B. This again had the sanction of the majority of the committee, but, as above stated, was disregarded.

We beg to call your attention to the report we made to you December 22, 1905, reporting a memorandum of agreement between a committee from the American Association of Steel Manufacturers and your Committee on Uniform Specifications, in which an agreement was reached to compromise on the percentage of phosphorus and sulphur. This compromise was adopted by the American Boiler Manufacturers' Association without dissent, but it afterward transpired that the committee of the American Association of Steel Manufacturers had no power to bind its association, for on January 20, 1906, that association resolved to sanction this agreement only so far as it referred to the American Boiler Manufacturers' Association, but to maintain the standard specifications of the American Association of Steel Manufacturers of February 6, 1903, as the basis for the general trade.

Now in view of this action of the steel plate manufacturers and the exercise of their influence against our compromise, before the committee of the American Society for Testing Materials, your committee deems it but proper to confess that the agreement with the committee of the American Association of Steel Manufacturers, published to our membership December 22, 1905, on page 154 of the proceedings of the seventeenth annual convention, 1905, has become invalidated and to recommend the readoption of the original specifications of the American Boiler Manufacturers' Association as to sulphur and phosphorus. These specifications agree with those of the United States Navy Department, for the same classes of steel.

Your committee further reports that Joseph H. Mc-

Neill, chairman of the Board of Boiler Rules of the Commonwealth of Massachusetts, addressed a letter to the American Boiler Manufacturers' Association in the following words:

This board desires an expression of opinion from you as to the advisability of making provision in the rules so as to take into consideration the yield point of steel, when the lowest yield point is stamped on the plates (in addition to the stamps of tensile strength), for calculating the maximum allowable working pressure on shells and drums hereafter constructed.

To which, after consultation with members of the committee, your chairman replied as follows:

1. As most boiler laws and regulations specify a factor of safety of five, and in some cases six, which is universally understood to be based on the ultimate tensile strength, the introduction of the elastic limit or yield point as a basis for the factor of safety would reduce it to between two and a half and three, and would lead to confusion.

2. There is always greater difficulty in determining the exact value of the elastic limit or yield point than the tensile strength. Only the best modern machines will give this with reasonable accuracy, and all testing machines of the older type—on which many communities have learned to rely—would become obsolete if this were introduced.

3. Only engineers and specialists would, in the beginning, understand this new factor of safety, and the general public might easily misunderstand and think the standards had been lowered.

4. This matter has been gone into in the past by engineering societies and testing bureaus, and the conclusion reached that no satisfactory benefit would be gained therefrom.

5. The general practice of specifying that the elastic limit should never be less than one-half the ultimate tensile strength seems to cover all the advantages which could be obtained from introducing the practice suggested.

6. The introduction of this new provision would naturally lead to the use of two different methods—the present one and the new one—for calculating the strength of boilers.

7. The question you raise is not an easy one to answer. I remember that at least 50 years ago engineers in Germany suggested that the practice of figuring the factor of safety on the ultimate tensile strength of the material was irrational because when the elastic limit is reached the usefulness of the material is gone. But the practice has nevertheless continued, and to change it now might be very misleading.

For instance, if you have specified by law or regulation a factor of safety of five, this would universally be understood to be based on the ultimate tensile strength, as the elastic limit or yield point—which are generally very close together—is about one-half of the tensile strength, you would have to specify a factor of safety of  $2\frac{1}{2}$  based on the yield point. One obstacle to basing the factor of safety on the elastic limit has always been the difficulty of determining the exact value of the elastic limit. Only the more modern test machines give reliable data. Now, in point of fact, there are a great many very good testing machines of the older type on which the community has learned to rely. If you now exact a factor of safety based on either the elastic limit or yield point, you would probably render useless quite a lot of testing machines which have heretofore been considered valuable.

Again, only engineers and specialists would understand the meaning of this new factor of safety, whereas the general public might easily get confused and think that you had lowered your requirements. I think that so radical a change should be very carefully considered, and that consulting engineers and steel mills which furnish boiler plate should be heard on the subject. Personally, I have always proportioned my boilers and all my work so as to be well inside the elastic limit.

I would respectfully suggest that you write to the American Society of Mechanical Engineers, as well as to the American Society for Testing Materials, as to their views on this subject.

Three members of your committee in February last met with the commission appointed by President Roosevelt, for the revision of the laws for greater safety of life at sea and discussed with them various phases of the rules proposed.

We take pleasure in reporting further that in the State of Texas and in this city of Detroit the matter of inspection laws for boilers has been seriously taken up. In Texas the legislation proposed was defeated. Those in charge of it intend to take it up again in the next Legislature. In Detroit an elaborate and carefully considered ordinance based largely on our uniform American specifications and on the boiler rules of the Commonwealth of Massachusetts has been passed and will be brought up for discussion in the course of our convention.

This shows then that the effects of previous committees of this association, on uniform inspection laws, which at the time, to the great disappointment of our members who worked so hard on them, seemed futile, have proved to be the good seed from which sound laws and ordinances governing the construction and inspection of boilers will grow.

Any one who will carefully read the history of this association cannot escape the conclusion that all these movements—national, State and municipal—for the better construction of boilers have grown out of the conscientious and persistent efforts of the American Boiler Manufacturers' Association in demanding the highest quality of materials and workmanship for standard American boilers.

#### Exhibit A.

The report of Committee R of this society of June 10, 1908, has been referred to you in order to decide on the recommendation contained therein for a change in the specification for steel boiler plate of this society. This recommendation was signed by six members of the committee only; two of the members, Messrs. Huston and McLeod, dissented therefrom. We deem it best to place before you a short historical review giving the facts on which the majority based their recommendation.

Before 1889 there were no specifications for boiler plate



in general use in the United States. Builders of stationary, marine and locomotive boilers contented themselves with simply specifying the brand of the steel, such as Otis, Park Brothers, Black Diamond or Marine. The material was accepted on faith. In October, 1889, the American Boiler Manufacturers' Association (hereafter designated as A. B. M. A.) at Pittsburgh, in convention assembled, drew up and unanimously adopted a specification for boiler plate, after a full and complete discussion of the requirements with a number of representatives of steel plate manufacturers, who were given the full privilege of the floor. Some of the steel plate manufacturers did strenuously object to these specifications, declaring they were too hard to fill. Thereupon Charles M. Schwab, at the time general manager of the Homestead Works, declared that he could and would make this steel. He did so and the others shortly after fell in line. After this these specifications were filled without any adverse criticism until about 1898. At that time the A. B. M. A., finding that these specifications were not only easily filled by various steel works, but that the maximum sulphur and phosphorus limits were rarely reached in practice, decided to make a slightly better specification.

The chairman of the Committee on Materials reported that out of 294 chemical tests of A. B. M. A. from plates made by eight different steel mills the average phosphorus was 0.022 and the average sulphur was 0.024, and concluded that if moderate specifications are made, the healthy competition and business pride among American steel makers will induce them not only to reach but improve on the quality specified. But soon after this the steel makers began to protest against these new specifications, and the Association of American Steel Manufacturers (hereafter designated as A. A. S. M.) agreed with the A. B. M. A. to a joint meeting of two committees, which took place December 15, 1905, and an agreement was reached as to a joint specification. This agreement was ratified unanimously by the A. B. M. A., but the A. A. S. M. on April 9, 1906, agreed to it only so far as it applied to the A. B. M. A., but resolved to maintain its standard specification of February 6, 1903, "as the basis for the general trade."

At the meeting of the joint committees December 15, 1905, the chairman of your R Committee submitted results of 599 tests of boiler plate made in 1904, which showed the following results:

	Maximum.	Minimum.	Average.
Phosphorus .....	0.031	0.007	0.016
Sulphur .....	0.036	0.013	0.024

Of these only three went above the 0.03 sulphur limit, namely, two were 0.031 and one was 0.036.

He, therefore, argued that a return to the A. B. M. A. specifications of 1889 would be a just and fair compromise. All the steel makers present assented to this, so far as the phosphorus limit was concerned, which they said presented no difficulty. But they strenuously opposed the reduction of the sulphur limit to 0.03 per cent., alleging that since they were no longer able to use natural gas in all their processes the elimination of sulphur had become more difficult. The boiler men argued against this that, first, a number of steel mills had been supplying A. B. M. A. steel under the 1889 specifications up to 1903, although they had never had the good fortune to have natural gas to use at any time, and, second, that a low percentage of sulphur was an absolute necessity in boiler plate, because of the well known fact that sulphur makes steel red short, and, therefore, danger must always be apprehended if by any of the chances of service the boiler plate becomes overheated. The chairman of the A. B. M. A. committee further reported that in every case where boiler plate had cracked in service he had found on chemical test of the failed plate an excess of sulphur.

The compromise finally agreed on was to permit 0.04 per cent. of sulphur and 0.06 per cent. of phosphorus in acid and 0.04 per cent. of phosphorus in basic steel for flange and boiler steel, and 0.035 per cent. of sulphur, as well as of phosphorus, in fire box steel and extra soft steel. The failure of the A. A. S. M. to ratify this unconditionally naturally caused a feeling of dissatisfaction in the A. B. M. A. It appears to them that questions of safety and uniformity have been subordinated to merely commercial considerations.

The A. B. M. A., being the originators in the United States of uniform specifications for boiler steel, believe that they are entitled to more consideration than they have received. Having reluctantly withdrawn their more exacting specifications of 1889 and expressed their willingness to return to the chemical specifications of 1889, and moreover recalling the substantial agreement between them and the A. S. T. M., they naturally expect from this society a conservative movement for the preservation of the earlier very moderate standard.

Your Committee R expressed the reasons for this in the report of June 10, 1908. In order to place the matter clearly before your committee we give here the present A. S. T.

M. specifications and the 1889 specifications of the A. B. M. A.:

	Phosphorus.	Sulphur.
A. S. T. M. flange or boiler steel.....	0.06 acid, 0.04 basic	0.03
Firebox steel.....	0.04 acid, 0.03 basic	0.04
Extra soft steel.....	0.04 acid, 0.04 basic	0.04
1889 A. B. M. A. all boiler steel.....	0.04 for basic and acid	0.03

We know no reason for allowing more phosphorus in acid than basic steel, nor any reason for allowing more phosphorus in extra soft than in fire box steel. We believe that 0.04 for both basic and acid steel will be fair and not too severe, and yet be on the safe side.

As for sulphur, we have not heard any tangible reason advanced why the limit of 0.03, which was cheerfully acquiesced in by all the steel plate mills making boiler plate from 1890 to 1902 should now be abandoned for a higher percentage in which there always lurks an element of danger. In considering this, it must always be remembered that the segregation of the metalloids, as conclusively shown in the beautiful experiments of Charles M. Huston of some years ago, makes it very probable that there will be spots in some of the plates where the sulphur runs higher than shown by the average mill tests.

(Signed) E. D. MEIER, chairman Committee R.

#### Exhibit B.

NEW YORK, June 29, 1909.

The American Society of Testing Materials:

Your Committee R on June 10, 1908, in a report on uniform boiler specifications, recommended that this society accept the joint specifications of the Association of American Steel Manufacturers and the American Boiler Manufacturers' Association of December 22, 1905. This report was signed by six of the members of the committee, but signature was refused by a minority of two. The majority represent builders and insurers of boilers and testing engineers; the minority are steel plate manufacturers. The matter was finally referred to Committee A, which, under the circumstances, refused to change the specifications of the society. As majority members of the committee who signed this report, we deem it our duty to enter our respectful protest against this rejection of our recommendation.

The whole difference lies in the chemical requirements. We deem it unsafe to allow more than 0.04 per cent. phosphorus or more than 0.03 per cent. sulphur in boiler steel. These maximum limits were first fixed by the American Boiler Manufacturers' Association in October, 1889, and were generally acquiesced in by the steel plate manufacturers, and there never has been any difficulty in obtaining plate which will fill these specifications. They correspond with the requirements of the United States Navy. During the 20 years since they were adopted much higher pressures and much greater capacity in evaporation have been demanded of boilers. It seems to us, therefore, unwise to reduce the requirements of the specifications for boiler plate.

(Signed) E. D. MEIER, Chairman.

Colonel Meier stated that Committee R of the American Society for Testing Material, although it split on the subject of steel specifications, was unanimous in regard to the yield point question. The committee is composed of consulting engineers, steel users and steel makers, and it unanimously objected to the introduction of the yield point as a factor in determining the strength of the materials. He called on Mr. Hartley to express his opinion.

Mr. Hartley said that it is not unusual to raise the yield point in a piece of steel without affecting the tensile strength. Whenever the elastic limit does not hold quite up to specifications by treatment with a hammer the elastic limit can be run up. Therefore, the elastic limit is an unsafe test for determining the strength of boilers. In some boilers built a short time ago, where the amount of steam to be carried was based on the yield point, they came into conflict with the Massachusetts laws, as they had to go into that State. The engineer was notified that he could not carry that much pressure. He disputed the point, and took some measures to have the law modified, but did not succeed; the result of that was that the question thus brought up caused an examination to be made of other boilers that had been running in about the same locality, with the consequence that they have also been reduced in pressure. It would be a dangerous thing to change the old mode of calculating the strength of boilers; you should adhere in order to avoid confusion and probable litigation and even an equitable matter in estimating on work to the old rule. It is not practicable, any way, to exactly ascertain the yield point without running a little over.

Captain Ress did not know of any testing machine that would give an exact result as to the yield point.

W. H. S. Bateman, being asked to state his experi-

ence, said that he was not actively representing at the present time any plate mill, but from past experience he thought that while too much stress could not be laid upon the question of elastic limit, specifications at the present time, so far as physical requirements are concerned, are being conformed to by all the plate mills in the country without any difficulty.

Mr. Leonard of Canada said that the question of uniform specifications is being agitated in Canada by boiler manufacturers very seriously; there are at present too many conflicting laws in the various provinces which are embarrassing to the manufacturer in the practical operation of his business. The Canadian manufacturers follow pretty closely the practice on the American side.

Joseph H. McNeill, chief engineer of the Boiler Inspection Department and chairman of the Board of Boiler Rules of Massachusetts, gave a résumé of the boiler inspection laws of Massachusetts and the work connected therewith from 1893 to date, including the work of the Board of Boiler Rules from their appointment, July 5, 1907, to date, showing that this board is ever ready to accept suggestions for the betterment of the regulations and giving every point brought to its notice careful and unbiased consideration. In this way the results reached are the combined efforts of the best boiler engineering practice of the country, if not the entire world, as directed to the conservation of life and property, in the construction, installation and inspection and operation of steam boilers. There are about 20,000 power boilers in the State of Massachusetts.

#### **The National Steamboat Inspection Rules.**

H. J. Hartley gave the results of a careful comparison of the revised rules issued January, 1909, by the Board of Supervising Inspectors of the Steamboat Inspection Service, Department of Commerce and Labor, with those formerly in vogue and which were the subject of much complaint because not adapted to modern conditions, stating that, on the whole, the present revised rules are much improved, with the exception of the clause relating to the thickness and testing strength of steel that goes into boilers intended for use on vessels plying on Western rivers that empty into the Gulf of Mexico or their tributaries. That is unsatisfactory, because it leaves them in the same predicament that they were before, when they were trying to get higher pressures.

Captain Rees stated that the changes for the better in this book of rules had been accomplished entirely through the efforts of the American Boiler Manufacturers' Association's committee meeting the board appointed by the president in October. Up to the present time, however, in the rules promulgated last there is the difficulty that with the 0.3S shell it is not allowed to be stamped over 62,000, and this does not give the factor of safety that will permit of the pressures necessary and desired. Immediately after the adoption of this provision now complained of, the speaker put an order in to a mill, and the mill refused to accept the order unless under a guarantee that the plate would be accepted. He took the order, stating that he would be responsible. He urged that the American Boiler Manufacturers' Association put itself on record that plates tested should be stamped at the testing strength they are actually pulled by the Government inspector. He had paid 1.1 cent per pound more to get it as he wanted it, and wished to get the full benefit of the testing strength he paid for. He also contended that as to flue diameters, as shown on page 37 of the January, 1909, issues of the Rules of the Steamboat Inspection Service, working pressures should be calculated and determined up to 16 in. in diameter instead of stopping at 13 in.

Colonel Meier expressed his agreement in the stand taken by Captain Rees that the testing strength should be stamped at the actual pull, and not arbitrarily fixed at 62,000, when it might be actually 70,000.

On motion it was resolved that it is the sense of the American Boiler Manufacturers' Association that such boiler plate should be stamped at exactly what it pulls as tested by the inspector.

A resolution was also adopted that the American Boiler Manufacturers' Association revert to its original

specifications as to sulphur and phosphorus in boiler plate material because the compromise made at one time with the American Steel Manufacturers' Association has not been lived up to by them.

Colonel Meier predicted that before very long the steel plate manufacturers will be furnishing boiler plate even better than that now contended for by the American Boiler Manufacturers' Association, and that without any trouble. Mr. Lappan concurred in this view and held that improved processes which are now being investigated, probably by the employment of vanadium and other alloys, will produce a boiler plate that will not only be better than the most exacting demands of the present as to low sulphur and phosphorus but will exceed present demands as to tensile strength and elastic limit and reduction of area.

At the Thursday morning session the Committee on Time and Place reported in favor of Chicago for 1910, and its report was unanimously adopted.

#### **The Officers Elected.**

The report of the Nominating Committee was adopted and officers elected as follows: E. D. Meier, New York, president; J. D. Farasey, secretary, Cleveland; Joseph F. Wangler, St. Louis, treasurer; T. M. Rees, Pittsburgh, first vice-president; J. Don Smith, Charleston, S. C., second vice-president; W. A. Brunner, Phillipsburg, N. J., third vice-president; H. D. Mackinnon, Bay City, Mich., fourth vice-president; M. A. Ryan, Duluth, Minn., fifth vice-president.

On motion of Mr. Broderick of Muncie, Ind., a vote of thanks was unanimously tendered to President Meier for the work he has done for the American Boiler Manufacturers' Association and expressing confidence that he will continue it in the future.

Mr. Lappan urged that hereafter a four days' session be held at annual conventions, beginning on Monday, in order to give time to transact all business and visit any manufacturing plants that it may be desired, and other entertainment in connection with the meetings, without cutting short business matters. This was agreed to, and next year's convention will be four days, to begin on Monday, dates to be hereafter determined.

Publication having been made in the *Detroit News* of August 12 to the effect that the decision of the American Boiler Manufacturers' Association was "that the trust will not manufacture a good quality of steel," and "the United States Steel Corporation's product contains too much phosphorus and sulphur," &c., this matter was brought to the attention of the convention by Secretary Farasey, who read the article referred to, headed "Blame Steel Trust for Boiler Explosions." Because of the fact that the United States Steel Corporation had been mentioned by name in the publication, when so far as known not a single member of the convention had made any such mention, it was deemed proper to take official cognizance of the article and disown responsibility for it, and a special committee, consisting of M. A. Ryan, H. D. Mackinnon and R. Munroe, Jr., was appointed, who reported as follows, which was adopted: "Resolved, That as to the article published in the *Detroit News* of August 12, 1909, headed 'Blames Steel Trust for Boiler Explosions,' the American Boiler Manufacturers' Association wants to go on record emphatically that this article was a misstatement of the facts. No such assertion was made on the part of any individual of the association in convention."

#### **The Banquet.**

On Thursday night the annual banquet was served at the Hotel Pontchartrain, at which Col. E. D. Meier acted as toastmaster, and the following named responded to toasts: Mayor Philip Breitmeyer, Detroit; H. J. Hartley, Philadelphia; Postmaster Homer Warren, Detroit; James Lappan, Pittsburgh, the father of the A. B. M. A.; Joseph H. McNeill, Massachusetts; C. H. Westcott, United States Supervising Inspector of Steam Vessels, Detroit; John J. Main, Toronto; George Wagstaff, past president International Association of Steam Boiler Makers; W. H. S. Bateman, secretary of the supply men's organization; Secretary James D. Farasey, and James Schermerhorn, publisher of the *Detroit Times*.

The associate members gave souvenirs in the shape



of a hand painted china plate, and the Champion Rivet Company presented a special souvenir.

#### Notes.

Officers of the supply men's organization were re-elected, as follows: W. O. Duntley, president; J. T. Corbett, vice-president; H. B. Hare, treasurer; W. H. S. Bateman, secretary.

C. C. Swift, representing the Cleveland Punch & Shear Works, exhibited at his parlor in the hotel reduced model of one of the company's large 24-in. C machines, for punching an inch hole through a  $\frac{1}{2}$ -in. plate and shearing  $\frac{1}{2}$ -in. plate. The model weighs 200 lb. and is an exact replica of a 7000-lb. machine, being complete in every detail. It was equipped with an automatic electric motor drive showing its operation, running 35 strokes per minute.

W. H. S. Bateman of the Parkesburg Iron Company and Champion Rivet Company and H. B. Hare of the Otis Steel Company entertained callers at their rooms, where samples of the products of the various companies were on display.

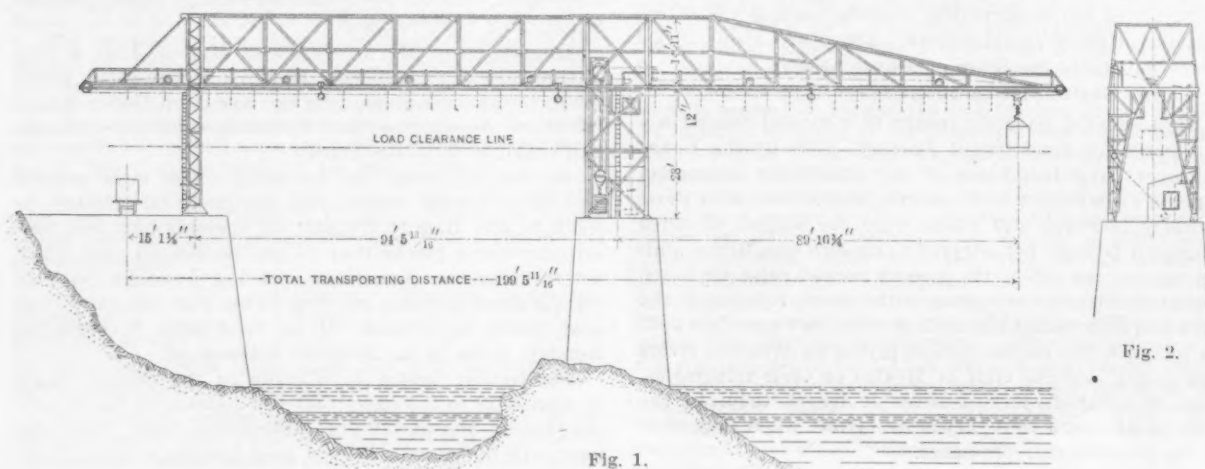
The excursion on the steamboat *Pleasure* on Wednesday afternoon and evening was a most enjoyable affair.

#### Conclusion.

On the whole the association had a successful and most interesting meeting. There was a full turnout at

### A Conveyor Bridge for Loading Vessels.

London *Engineering* describes a Temperley "bridge transporter" built by Applebys, Ltd., London, and erected at Hermigua, in the Canary Islands, where it is used for unloading steamships. Owing to the difficulty of loading and unloading steamers at this port the special form of transporter shown was chosen. It has a cantilever extension at each end, one of the supports being on the mainland and the other on a concrete foundation in the water. Figs. 1 and 2 show the arrangement in side and end elevation respectively. The cantilever extension at the water end enables steamers to come under the transporter in fine weather for loading and unloading, but when the swell is too great the steamer is anchored some distance away, goods are loaded into or unloaded from barges by means of the transporter, and thus transferred to and from the vessel. The total transporting distance is approximately 199 ft. 6 in., and the span of the central portion between the centers of the supports is 94 ft. 6 in. The overhang of the cantilever at the land end is 15 ft. 1 in. from the center of its support, while the overhang of the cantilever at the water end is 89 ft. 11 in. from the center of its support. The working load is 1 ton, which can be lifted at a speed of 300 ft. per minute. The speed of transporting is 500 ft. per minute. As electricity



Side and End Elevations of a Conveyor Bridge for Loading Vessels.

all sessions, and the matters discussed awakened more than usual interest. Active work is now under way by the association looking to an enlarged membership, without which concerted action along desirable lines cannot be efficiently undertaken. The work of enlisting wise and fair legislation, both Federal and State, has been undertaken in this organization by a faithful few, whose efforts have largely helped the entire trade, and this cannot fail to be appreciated by the intelligent boiler manufacturers of the country. It is believed that at next year's convention, which is to be held in Chicago at a later season of the year, and to which four days will be devoted, the fruit of the work in securing co-operation of all boiler manufacturers will evidence itself substantially in increased support and attendance.

**Indiana's Coke Production in 1908.**—For the first time since 1903 Indiana appears as a coke producer in the report compiled by E. W. Parker and issued by the United States Geological Survey. The output for 1908 was obtained from 10 ovens constructed during the year by the United Fourth Vein Coal Company at Black Creek. The coal used was unwashed slack, and the total amount of coke produced was 1747 net tons. The 36 ovens of the Ayrshire Coal Company at Ayrshire have not been operated for several years. During 1908 the Citizens' Gas Company of Indianapolis began the construction of 50 United-Otto ovens, and these will possibly be completed and placed in operation before the close of 1909. The probability is that West Virginia coal will be used in these ovens. The Indiana Steel Company is now constructing 560 Koppers ovens at Gary, which will be producing coke early in 1910.

is not available at the site, the driving power is derived from a 10 x 10 in. direct acting Temperley engine, supplied with steam from a cross tube boiler.

### Metal Trades Working Exhibits at Seattle.

The working exhibit at the Seattle, Wash., Exposition representing foundry, machine shop, forge and pattern shop operations is now in readiness for regular work under the auspices of the Pacific Coast manufacturers in metal working lines. The foundry cupola will be in charge of a representative of the Pacific Coast Testing Laboratory. It is planned to bring down heats of gray iron and semisteel, the latter mixture containing bolts, boiler tubes, punchings and other shop scrap. Demonstrations will be made of the results of additions of ferrosilicon and ferromanganese to gray iron, charges being regulated by analysis. A record of costs of the various additions will be kept. There will also be demonstrations of oxyacetylene and thermit welding of cast iron. Three types of molding machines will be demonstrated, a sand blast will be used for cleaning castings and a mill will be operated for the recovery of shot metal from foundry refuse. An oil furnace will be used for brass melting, and manganese bronze showing a test of 70,000 lb. will be produced. Core ovens, core machines and other foundry appliances will be exhibited. A gas producer plant will be operated on various kinds of fuel, including shavings and lumber waste. In the machine shop demonstrations will be made with high speed steel showing savings of 25 to 50 per cent. in certain operations. Instruction will be given also in the dressing of high speed steel tools.



### The Anderson Pressure Reducing Valve.

The reducing valve herewith illustrated is the XX extra heavy valve brought out by the Golden-Anderson Valve Specialty Company, Fulton Building, Pittsburgh, Pa. It is intended for steam, oil, water, gas or air, and is described as always ready for service and always cushioned in opening and closing. Its action is thus described: The spring B is adjusted by the bronze screw sleeve A in which it is encased to the required pressure. This spring acts on diaphragm C, moving auxiliary valve



The Anderson Pressure Reducing Valve Made by the Golden-Anderson Valve Specialty Company, Pittsburgh, Pa.

D, unseating it. The pressure or inlet side of the valve is at E. The low pressure or outlet side is at F. The steam on the high pressure side fills the inlet chamber, exerting a pressure on upper valve I and under lower valve J, also passes through port G located in the large piston K into chamber L, and as the spring is holding auxiliary valve D open, the steam passes on through port M and N to the low pressure side of valve F. When the pressure on the low side has reached the pressure at which the valve is set, the pressure, still increasing, exerts a pressure under the diaphragm C which moves upward compressing spring B and allowing auxiliary valve D to close, thereby closing off the low pressure from the high pressure side.

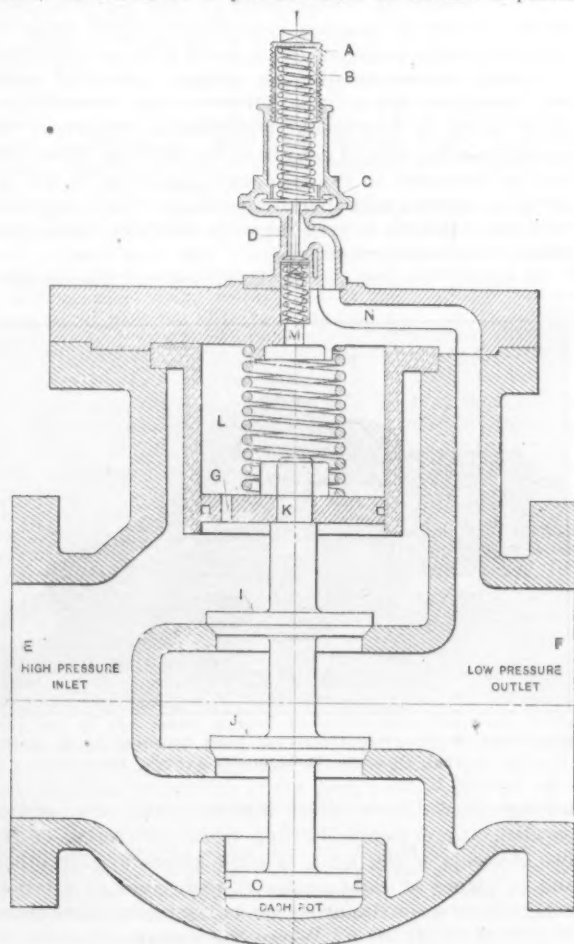
### The Use of Charcoal in Melting Brass.

The following article from the *Metal Industry* deals with the value of charcoal in connection with the melting of brass and explains why some users of charcoal do not obtain the expected results:

While many articles have been written regarding the use of charcoal as a deoxidizer in the manufacture of brass, the real fundamental principle of the process is often overlooked. This being the case, when some one not thoroughly familiar with chemical reactions tries it and results are not satisfactory, the process is condemned as wasteful and expensive, though through no fault of the material used.

As is well known, copper, the principal component of brass, is very susceptible, when in the process of melting, to oxygen. It thereby forms the first of a series of oxides, cuprous oxide or  $\text{CuO}$ ; this oxide the metallic

copper is capable of dissolving. The mixture thus made renders the resulting brass cold short, or brittle while cold, and as practically all brass mixtures are worked cold this is very detrimental to the successful manufacture of good brass. When charcoal (chestnut size is best) is added to a pot of brass or bronze a partial



oxidation of the carbon of the charcoal takes place at once. This is due to the combination of the carbon with the oxygen of the draft, forming carbon monoxide or  $\text{CO}$ . Carbon monoxide is an excellent reducing agent in that it takes up an additional atom of O and forms thus carbon dioxide or  $\text{CO}_2$ . This second portion of oxygen is derived from the metallic oxide already formed by the metal. This reaction would be expressed by the formula  $\text{CuO} + \text{CO} = \text{CO}_2 + \text{Cu}$ . The carbon monoxide, therefore, robs the copper oxide of one molecule of oxygen, thus liberating the copper in its original state.

Now we come to the really important stage of the process. It must be kept in mind that when the carbon dioxide has been formed this is as far as the reaction can go. If means are not now provided for the retention of the protective cover of carbon dioxide, we will speedily find that our charcoal is used up and the copper will oxidize as before. The remedy lies in not filling the pot with molten metal within less than 2 in. of the top. This gives an opportunity to keep a layer of charcoal completely covering the metal, and what is more important, a layer of carbon dioxide gas, thus effectively preventing further oxidation.

Carbon dioxide—carbon anhydride—carbonic acid gas is a heavy inert gas that does not support combustion. It has a specific gravity of 1.52, hydrogen being .062, and a vapor density of 22 where hydrogen is 1. If the metal in a crucible is level with the top (as is often the case) the heavy carbon dioxide formed at the expense of charcoal is immediately forced over the edges of the pot and its valuable effects are lost. By observing this very simple precaution there is no flux or deoxidizer for brass easier to apply than charcoal, but, as can be seen, it is equally easy to sidetrack its most valuable quality.

### An Improved Ball-Bearing Universal Joint.

BY B. FRANK TEAL, GLENSIDE, PA.

Notwithstanding the importance of the universal joint as an element in machine construction, there seems to have been, until a comparatively recent date, no real effort to develop the device from its original somewhat crude and elementary form. The advent of the so-called propeller drive in automobile transmission, however, has emphasized the radical defects in the existing types and has led inventors to exercise their ingenuity in the attempt to produce such improvements as would overcome the faults inherent in even the most carefully constructed joints of the ordinary designs.

Generally considered as a means of transmission

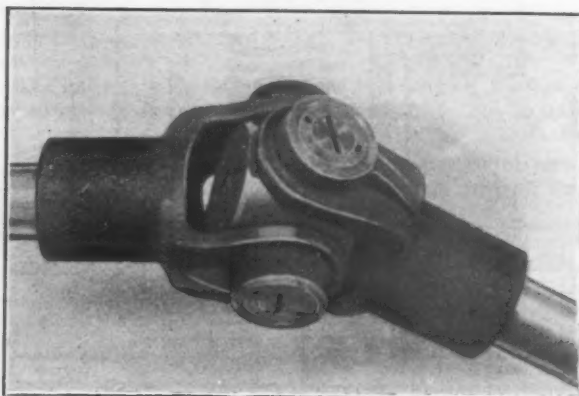


Fig. 1.—A Ball-Bearing Universal Joint Invented by B. Frank Teal, Glenside, Montgomery County, Pa.

through shafts revolving on different axes—i. e., out of parallel, any device permitting vibratory motion of the two elements of the joint, at right angles to each other, and in planes at right angles to their axes of rotation, will fulfill the conditions so far as the mere transmission of motion is involved. Where the amount of power to be transmitted is slight and the object is motion rather than power, the ordinary forms of joint are sufficiently effective, but where shafting is used specifically as a means of power transmission, and the shafts are re-

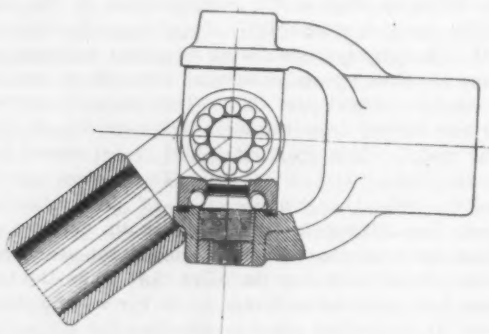


Fig. 2.—Sectional View of the Teal Universal Joint.

stricted to a size calculated for the duty required, the limitations become very apparent; and even at low rotative speed and comparatively slight angles of divergence of the two axes (say 5 to 7 deg.) the amount of friction in the joint is so great as to render its use objectionable, and in many cases prohibitory.

Unquestionably the trunnion joint is the type most generally used, and the simplicity of its design, involving but three elements, renders it one of the most desirable. The proposition then becomes the elimination of journal friction on the trunnions, as this constitutes the sole factor inimical to the efficiency of the trunnion type. The solution is a ball-bearing trunnion, together with the important accessories—automatic lubrication and the sealing of bearings against the admission of dust or other abrasives.

Fig. 1 shows the external appearance of a new joint

embodying the above essentials; and though it has large ball bearings, it is self-oiling and dustproof. Its appearance differs but little from an ordinary trunnion joint; in weight and dimensions it is no greater. The construction shown in Fig. 2 is that adapted to commercial considerations, and in the details it will be seen that cost of manufacture has been reduced as far as possible. With the exception of the yokes, the parts are all automatic screw machine work.

Extended description of the illustrations is unnecessary, as the general features can be seen at a glance. Briefly all four of the trunnions are alike. The ball bearings are preferably of the cup and cone full type, the cups being formed in the oscillating member or center block and the cones or trunnions screwed into the edges of the yokes. It will be noticed from the location of the point in the ball race, at which the balls have their bearing, that the working strain comes so closely to the support of the trunnion as to obviate any liability to fracture of the latter; while the considerable body of metal surrounding the track of ball contact in the cup renders it equally strong.

The balls, preferably 12 to each bearing, are of large size—those used in a joint for a 1 1/4-in. shaft being 1/4 in. diameter. Only the best quality of balls can be used, as it is absolutely necessary to keep variations in diameter down to about 0.001 in. This applies to any ball bearing subjected to heavy working strain.

In assembling the joint, the balls are dropped into a groove in the center block through the eye in the yoke, and the trunnion is then screwed into place, the lock nut having been previously screwed down to the shoulder so

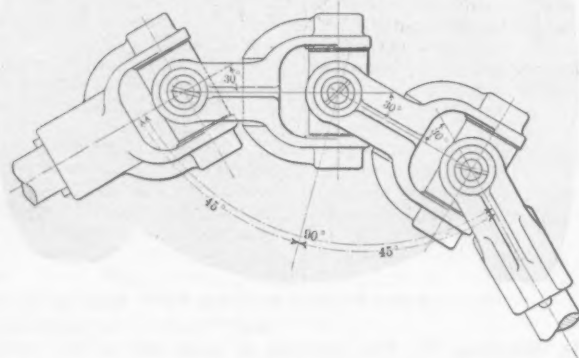


Fig. 3.—An Application of the Teal Universal Joints to a Right Angle Transmission.

that the slot registers with that in the reduced portion of the trunnion. This causes the external thread on the lock nut to correspond with that on the body of the trunnion, as both are of the same pitch. As soon as the trunnions are all in place, they are adjusted to accurately center the oscillating or center block, and they are then locked in the adjusted position by turning the lock nut either forward or back until it binds firmly between the internal and external threads. The difference in pitch between the two threads is about 1 thread per inch—say 24 threads to the inch for the external and 25 for the internal thread. Before assembling, the felt disks are inserted in the ends of the oil chamber and the felt washers in the annular grooves in the yokes. The oil chamber is then filled, the plug screwed in and the joint is ready for operation.

Under working tests the joint shows capacity for rotative speeds under extreme angularity unheard of in devices of this class, and in point of strength it is capable of safely bearing a torsional strain sufficient to rupture the shaft. In a speed test without load at about 1800 rev. per min., at an angle of 30 deg., the driven end of the shaft was simply supported in a shallow V notch, and although but 12 in. long, and therefore of small proportionate weight, it lay perfectly quiet in its support.

A test of strength was made with the intention of adding load until fracture of the weakest portion. The dynamometer appliance used, however, was insufficient in capacity to effect this result, and the greatest strain that could be obtained was a pressure of 5000 lb. on the balls.



The joint was then tested as to the effect of this strain and was found to show no perceptible lost motion, nor grooving in the contact track in the ball races. The test was made at 120 rev. per min., at an angle of 30 deg. and lasted about 1½ hr.

In Fig. 3 is shown the application of the joint to right-angle shaft transmission, which requires no explanation.

After an investigation by its committee on Science and the Arts, the Franklin Institute has awarded the inventor the Edward Longstreth medal of merit. The device is patented by the author, who intends to manufacture it for the market.

## Judicial Decisions of Interest to Manufacturers.

ABSTRACTED BY A. L. H. STREET.

**Employees—Taking Away Trade Secrets.**—An employee, on termination of his employment, has no right to carry away records or documents containing trade secrets or other confidential matters relating to the employer's business; if he does so a court of equity will grant relief by requiring him to return them and enjoining him from using or communicating their contents to others. (United States Circuit Court, Southern District New York; *Union Switch & Signal Company vs. Sperry*, 169 Federal Reporter 926.)

**Power Contracts.**—A contract of lease which provides that it includes the furnishing of 25 hp. based on the rated capacity of motors, and that all power utilized in excess of that amount shall be paid for at a specified rate per horsepower per annum, bases the power to be furnished on the rated capacity of the motors, and, where the rated power of the motors used exceeds 25, the lessor is entitled to additional payment for each rated horsepower in excess of 25. A lessee has no right to an injunction restraining threatened summary proceedings where he alleges facts showing a legal defence to the proceedings. A payment made with full knowledge of the facts, without coercion, fraud or mistake, is voluntary and cannot be recovered, though the person receiving the money could not have compelled payment. A lessee who sues the lessor for breach of contract for his failure to furnish power cannot recover special damages, where no special facts are alleged to take the case out of the general rule that the proper measure of damages is the difference between the rental value of the premises without the power contracted for and their rental value with the power furnished. (New York Supreme Court, Appellate Division, Second Department; *Kienle vs. Fred Gretsche Realty Company*, 117 New York Supplement 500.)

**Notes—Contracts—Effect of Failure to Sign.**—Omission to execute properly a collateral agreement as a consideration for which notes are given does not necessarily render notes, properly executed and delivered, void for want of consideration. Where a written contract is executed in duplicate, omission of one of the parties to sign both papers does not render the agreement invalid as being onesided. Where the second party to a contract made by an agent failed to repudiate it until after notice of ratification by the principal, he cannot then withdraw therefrom except on grounds entitling him to a rescission. In the absence of fraud or deception, the fact that the purchaser of the right to sell a patented article in a specified territory paid too great a price therefor does not entitle him to a rescission. (Iowa Supreme Court; *Owens vs. National Hatchet Company*, 121 Northwestern Reporter, 1076.)

**Contracts—Right to Contradict Written Agreement.**—Defendant agreed by an instrument in writing to purchase from plaintiff lamps and attachments described in such instrument at specified prices, in consideration for which defendant was given exclusive selling rights in a certain territory. Plaintiff, having delivered lamps in accordance therewith, sought to recover a balance due. Defendant offered to show by verbal evidence that the written instrument did not express the true and full agreement of the parties. Held that the agreement was complete and entire, and that the evidence was properly excluded. (Minnesota Supreme Court; *Minnesota Trading Company vs. Penn Oil & Supply Company*, 121 Northwestern Reporter 907.)

**Contracts—Effect of Failure to Read Before Signing.**—A business man of experience cannot escape his contract undertaking on the ground that he signed the contract without reading it, when the only person who can contradict his present statement that something else should be read into the instrument is insane. (New York Supreme Court, Appellate Term; *Howell vs. Bloom*, 117 New York Supplement 893.)

**Notes—Rights of Indorser.**—Where the holder of a note

released the maker, and reserved no right of recourse against the payee and indorser, secondarily liable thereon, such indorser was also discharged under the New York Statute which provides that a person secondarily liable is discharged by a release of the principal debtor, unless recourse against the party secondarily liable is expressly reserved. (New York Supreme Court, Appellate Term; *Ziegfried vs. Stein*, 117 New York Supplement 900.)

**Sales—Cancellation of Order.**—If a buyer canceled his unaccepted order for goods to be manufactured before the seller had done anything except to furnish estimates, no consideration for a contract arising from the order had passed, and such a contract would be wholly one-sided and hence unenforceable. (New York Supreme Court, Appellate Term; *Staines, Bunn & Taber Company vs. Duggan*, 117 New York Supplement 1005.)

**Contracts—Construction.**—An accepted proposal to furnish sheet metal work, "consisting of ceilings, side walls and wainscotings," and a letter delivered contemporaneously with it, which recognizes that the work contracted for is "interior sheet metal work," will be read together for the purpose of showing that the proposal only covers interior work. (New York Supreme Court, Appellate Division; 117 New York Supplement 632, *New York Metal Ceiling Company vs. City of New York*.)

**Construction Contracts.**—Where a contract to construct a dock and to make the necessary fill inside the crib from an upland, and grade the remainder of the land from a certain avenue to the dock, provided that defendant should pay plaintiff \$3500 on completion of the dock, defendant was liable for that sum when the dock was finished and accepted, though plaintiff had not completed the grading. At the time plaintiff sued for its compensation it had completed the dock and filled the land designated to an elevation of 5 ft. 5 in. above the low water mark, which was about a foot below the high water mark, so that the dock could be continuously used, and defendant's inspector testified that it was fairly well leveled up. Held that the contract was substantially performed. Plaintiff on October 9, 1906, rented riparian land from defendant for two years, and in consideration of the lease agreed to build for defendant within three months a crib dock on the leased and adjacent premises belonging to defendant, for which defendant agreed to pay \$3500 on completion of the dock, plaintiff further agreeing to make the necessary fill inside the crib as above stated. Held, that while the plaintiff was bound to build the dock within three months, it had the whole term of its lease within which to do the filling, and, hence, in an action to recover the contract price prior to the expiration of the lease defendant could not set off damages because of alleged failure to properly construct the fill. Plaintiff's claim that the contract only required it to grade the land leased, though unsustainable, did not constitute an abandonment of the contract. Plaintiff could not abandon the contract without surrendering possession of the land. (New York Supreme Court, Appellate Division, First Department; *Pennsylvania Steel Company vs. Susswein*, 117 New York Supplement 436.)

**Sales—Guarantee.**—Where a guarantee was only to apply in case of a sale of certain machines to another, and the machines were merely sent to him for approval, after they were tested and were returned without a sale, no liability arose under the guarantee. (New York Supreme Court, Appellate Division, First Department; *Pope vs. Fairchild*, 117 New York Supplement 575.)

**Conditional Sales—Liability of Third Person.**—Where ranges were sold to a plumber, with knowledge by the seller that they were to be placed in and connected to buildings in fulfillment of contracts held by the plumber, the seller has no lien on them for the price, though the contract of sale provided that they should remain the property of the seller until paid for; such contract not being filed, and the owner of the buildings not knowing of the contract until he had paid the plumber. (New York Supreme Court, Appellate Division, Second Department; *Jacobs vs. Feinstein*, 117 New York Supplement 823.)

**Partnership—Accounting.**—An interlocutory judgment in proceedings against a surviving partner for an accounting, which states that accounts between the partners were as of a certain date, precludes the right of either partner to interest on profits that were not paid to the partners before that date; there being no finding with reference to interest in the judgment. In an action against a surviving partner for an accounting, if one partner is allowed interest on his share of the profits that are not withdrawn from the business, the co-partner should also be allowed interest. In such an accounting, in order to fix the amount payable out of the deceased partner's share to a person from whom he borrowed money for use in the business, the surviving partner should be charged with the value of the property which he realized on a sale of the property by him after the death of his partner, rather than the market value at that time. (New York Supreme Court, Appellate Division, First Department; *Kirkwood vs. Smith*, 117 New York Supplement 686.)



# THE IRON AGE

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				HARDWARE EDITOR.

## New Iron and Steel Making Capacity.

Every revival in the iron trade like the present one brings up the question of the immediate and prospective relation of consumption to producing capacity. It is not the habit of the iron trade to enter upon new programmes of construction in slack times, but it has often been noticed that new mills, steel works and furnaces started in a boom are nearly ready to produce when the break comes, and thus have to be reckoned with when demand again shows signs of strength.

As is well known, the United States Steel Corporation was the chief builder of new capacity in the recent depression. Comparatively little was done by any of the independent steel companies, though one had completed a new open hearth plant and a rail and a structural mill in 1907. Another had important blast furnace and steel works additions under way in 1907, and practically suspended work on them throughout 1908. A third, an Ohio company, had some new finishing capacity started at the time of the panic, on which work was stopped for a while, but was resumed in 1908, while two new blast furnaces of the same company were blown in last year, and it will now build a third. In the Pittsburgh District a producer of wire products completed its open hearth plant last year, and thus became a buyer of pig iron rather than of steel. On the seaboard a long established steel company held in abeyance its plans for an open hearth plant through the hard times and only began to build in a recent month. In the Mahoning Valley new wrought pipe capacity is now under way, since financing is possible that could not be thought of last year, and the same company has plans for open hearth furnaces. In the Pittsburgh District the new blast furnaces and steel works referred to above will bring along with them considerable new finishing capacity representing wire, tin plate and wrought pipe. Of three steel plants of moderate size thrown idle in 1907 by financial troubles, one of the two in New York State has been started again, while that in Alabama is to resume with an expansion of connected finishing mills. In the Lehigh Valley new blast furnaces as well as an open hearth plant and a finishing mill are projected. The list might be considerably lengthened by enumerating less important projects. Moreover, the Steel Corporation has considerable work under way apart from Gary.

It is evident, therefore, that the new period of prosperity upon which the iron trade appears to have entered begins with a considerably increased ability to produce pig iron, steel and finished material; also that con-

struction now under way and plans about to be carried out will make further additions of new plant at intervals in the next 18 months. This situation is of particular interest, with one of the sharpest struggles for tonnage in the history of the trade but a few months behind us.

After each financial setback, this country, when it again finds itself, finds not the old ability to consume iron and steel, but a consumption with which the old supply cannot cope. It is never possible to set down in advance just what are to be the sources of this increment. There is not now nor immediately in sight a consumption equal to that of the first half of 1907, yet the expectations of the iron trade are centered upon prosperous employment in the coming year for a capacity well beyond that of two years ago. Faith exists that history will repeat itself, even though there is now relatively more new plant than has been at hand early in other trade revivals. The continuance of construction at Gary through the depression is chiefly the cause of this new condition.

Without going into detail as to the new finishing capacity that has come on since 1907, conspicuous in which are the rail mills at Bethlehem, Ensley and Gary, some measure of the new construction is possible in blast furnace lines. It can only be approximated. The Directory of the American Iron and Steel Association estimated the pig iron producing capacity of the country in November, 1907, at 34,000,000 tons. This includes a number of furnaces that probably will never run again. Many others can only operate when the price of pig iron is abnormally high. Further, a certain percentage of capacity is under repair at a given time, and the facilities for ore and coke production fall considerably short of the theoretical furnace capacity. In the first half of 1907, under the greatest strain ever put upon the country's blast furnaces and when their full possibilities seem to have been realized, our pig iron production was 13,478,044 gross tons, or at the rate of 26,956,088 tons a year. Counting out furnaces blown in in the first six months of that year, we may reckon the effective capacity at the beginning of 1907 that could be simultaneously worked as capable of 26,400,000 tons a year. The recapitulation of new furnaces blown in since January 1, 1907, is as follows:

	No.	Annual capacity, Gross tons.
1907.....	15	2,050,000
1908.....	11	1,300,000
1909 (to July 1).....	6	850,000
Totals.....	32	4,200,000

This brings the total on July 1 to 30,600,000 tons, with all the deductions referred to above for furnaces idle because of unfitness, high costs and reconstruction and repairs. One new furnace at Buffalo with capacity of 140,000 tons has gone in since July 1, and 13 coke furnaces are building—one at Duquesne, three at Aliquippa, one at Coatesville, two at Cleveland, four at Gary, one at South Chicago and one at Detroit. Their combined capacity is 1,800,000 tons, and all but three can be finished this year, while February is the latest date set for the others. Thus by the early part of 1910 our pig iron production could reach 32,000,000 tons a year, as against a present rate of production of 25,500,000 tons. No account is taken above of furnaces reconstructed since the beginning of 1907 or so improved as to increase their capacity. Such additions doubtless more than offset the furnaces going on the unfit list. On July 1 this year 14 furnaces were being rebuilt.

These blast furnace figures become significant of the situation in finished steel, since the new furnaces blown

in since January 1, 1907, and those now under construction are very largely steel company furnaces. To a small extent these latter represent the displacement of merchant iron bought at times by these companies. They signify for the most part, however, a corresponding increase in finishing capacity. Of the 33 new coke blast furnaces blown in since January 1, 1907 (not counting rebuilt furnaces), 11 were for the United States Steel Corporation and nine for independent steel companies. Of 13 furnaces now under construction, five are for the Steel Corporation and four for independent steel companies. It is plain that demand may still increase materially in the next 12 months without putting the industry under such strain as was experienced in the first half of 1907. There may prove to be at times a lack of balance between pig iron and steel on the one hand and some finishing line on the other, but on the whole the abundant supply of producing capacity available now and in the near future should dispel any fear of excited advances or of any approach to famine conditions.

### Reciprocity with Hydraulic Power Plants.

Some of the more recently established hydraulic power companies in Eastern manufacturing sections are attempting the experiment of reciprocal relations with customers, the idea being that the latter shall maintain their steam plants in idleness, holding them in reserve for periods of low water, when the power company in turn shall become the customer. The company offers to sell its power at so low a figure that the consumer can afford the idle power plant. In one such instance the price named was 2 cents a kilowatt hour, or a little over \$25 a horsepower year of 10-hr. days, the company agreeing to pay the customer 4 cents a kilowatt hour for his steam generated electric power should it become necessary to supplement the product of the hydraulic station. As this proposition is generally understood, the company would take all excess of power above the consumer's wants at 4 cents, and for what he uses would give him a bonus of 2 cents a kilowatt above his contract price.

Such an arrangement might do where a manufacturer already has a power plant. If, to take a locality off navigable water, it costs \$35 or \$40 to produce a horsepower, and it can be bought of an electric company for \$25, the saving would warrant keeping the private plant in condition for operation. Most owners would retain their power equipment anyway; but for the new industry, or for the old which provides for its growing needs by the purchase of additional power, the power company must provide against any possibility of compulsory shutdown by its consumers.

The only certainty lies in the power company having its own auxiliary steam or gas engine plant large enough to assure ample power, regardless of the condition of the water supply. The power company can as well afford to maintain a steam plant in idleness as can its customers. The proportionate increase in expense could be included in the price at which the power is marketed. It would not take a large advance to secure the revenue to care for the additional investment; the difference certainly would not be great as compared with the value of absolute assurance to consumers that they would have their power whatever emergency might arise. There is the danger of interruption of current by accident to the main transmission lines, particularly in a climate which develops severe wind or ice storms. Local private power plants as auxiliaries might be valuable in such regions.

The company's own auxiliary plant need not be at the hydraulic station; its current need not pass through a long distance transmission cable, but would better be centrally located as regards points of consumption. In large manufacturing communities, using great amounts of power, the station should be located within the city itself, if possible. Where a stream cannot be depended upon for a constant supply of power because of periodical droughts, consumers are strongly prejudiced by the sense of insecurity. Some of the great rivers furnish an abundance of power even at low water. It is the smaller stream—at some seasons a torrent, at others a rivulet, requiring large reservoir capacity to develop the power—which needs the auxiliary steam plant. The Appalachian region contains many such rivers. Reservoirs above the plant assist in avoiding the emergency, but where large units are developed storage capacity must be very great indeed in times of drought. The only real reliance is the auxiliary station.

### Self-Help in Fighting Tuberculosis.

The city of Hartford, Conn., has an admirable organization of employees in industrial occupations, the special work of which is the care of those who are sufferers from tuberculosis and the safeguarding of working forces and their families from infection with the disease. It is a notable example of self-help, which counts for so much in all benevolent enterprises. Begun by the men and women in the works, employers have noted the excellent results achieved and are actively co-operating, matching dollar for dollar the funds raised for the care of tubercular patients and their families. The movement is spreading from Hartford to other Connecticut cities and promises to exert a far-reaching influence on industrial conditions. John Gunshanan is the founder of the movement, which has grown out of an organization known as the Workingmen's Free Reading Room Association. Originally the association paid the maintenance fee of the patient at the State sanatorium, amounting to \$7 a week, every cent of which came from the pockets of the working people. The sanatorium had been closed for lack of funds, and the Hartford movement caused its reopening. The association secured a State appropriation for the hospital, because of which the fee was reduced to \$6. Then the employers took a hand and agreed to pay half, so that \$3 weekly was diverted to the care of the patient's family. The movement has done so much to quicken the establishment of large sanatoriums throughout the State that Connecticut promises to have one of the best public systems in the world for the treatment of tuberculosis.

It has proved to be a very important factor in the work that the initial development of the movement was by the working people. Its influence is vastly greater, probably, than if employers had been the founders. The association, divided into 42 units, each representing one establishment and organized within itself, consists of nearly 10,000 members. Their own potentiality in educating the masses as to the dangers and preventives of the disease is enormous. Compare it with what would have resulted had the employers taken the initiative, and the difference is easily evident. The influence upon a central legislative body must be great as the movement spreads. All through those sections of the country where tuberculosis exists as a serious menace to health and life employers are awakening to the good that can be accomplished for their people and indirectly for themselves by a campaign of education and assistance. The



Connecticut experiment demonstrates that the most effective beginning of the work is that which comes in the true spirit of independently conducted self-help.

### The Constant Comparison of Costs.

A machine tool builder is obtaining a large increase of production by a system of constant comparison of present and former costs of work. Upon the completion of every lot the cost department makes out a slip containing its cost and the records previously obtained for the same job, together with the workman's number, and the slip is placed immediately upon the superintendent's desk. If the new cost is higher than the old he investigates. If there is a gain he notes it. The slips of each workman are kept together. The men understand the system and the check which it puts upon their labors and its consequent influence upon their employment and wages. There is a sharp inducement to keep production up where it should be.

An everyday record of each man's work is an important factor in shop management. The superintendent knows the earning power of each. A new employee is quickly and definitely estimated. With the increasing demand for workmen requests for higher wages are becoming more frequent. The superintendent has but to run through the bunch of slips representing the applicant's record to learn whether he would be justified in granting an advance. If the man has been saving time and money on his work there may be reluctance to run the risk of his going elsewhere. If, on the other hand, his production record is below that of others who have done the same work the desire to keep him might be insufficient to warrant higher pay. The system is also a counter influence to the tendency of some workmen to let down from the diligence they showed in dull times when working forces were being sifted.

## CORRESPONDENCE.

### One Cause of Railroad Wrecks.

*To the Editor:* The cause of a great many wrecks which railroad men have failed to locate, either on account of not knowing the true cause or not starting at the bottom and figuring out the reason, is as follows:

For the sake of illustration, we will call the butt of an oak tree the south end and the top the north end. The butt log, or No. 1, is solid and compact, and contains the best lumber in the tree. This is on account of the tree having all its weight on the butt while growing, which makes it hard and solid. The second log, or No. 2, while not so tough and compact, still has the weight of the top and the branches and contains good lumber. Now the top log, or the log that the railroad ties are made from, only has the weight of the branches, and as we all know that the sap in a tree goes to the top, it makes this log soft, sappy and brash. The further toward the top, the softer and sappier the log. Now, what have we in tie timber? One end of the tie is softer than the other end; that is to say, the north end of the tie is softer than the south end.

Lay those ties in a track and what is the result? There is not a railroad track foreman or supervisor or even an engineer who can tell the north from the south end of a sawed tie. He can, if careful, tell a hewn tie, but what foreman on any railroad does this? The ties are put in the track as they come, namely, with some of the north ends of the ties to the right and some of the south ends. Now, take the large 100,000-lb. capacity cars, built up high and top heavy, and run them over those ties and the north end of the tie will cut in and cause the rail or tie plate to sink in the ties faster than on the south end or harder part of the tie. This will cause a vibration at the wheel base, the vibration increasing vertically, so

that the top of the car has a large swing back and forth. The motion of the train also helps to keep up and increase this swinging motion at the top. What railroad man has not noticed the rolling of a heavily loaded train?

There have been numerous accidents from this cause, as follows: Lumps of coal have been thrown off and passengers killed in passing trains; cars standing on switches, although back of the safety post, have been side-wiped and wrecked or have caused the passing train to be wrecked, and the excuse has been that the car was not in on the switch far enough, when this was not the true case; trains in passing each other have had wrecks caused by the rocking of the cars and the tops striking together, and when an expert is sent to investigate he reports, after finding a broken axle or wheel caused by the wreck, that that was the reason, when in reality it was caused by the rocking of the cars.

The tie plate now used is a help for a short time, but very short, say six months, on a new tie; then it also commences to cut in and, although ever so small, it starts the vibration and gets worse and worse day by day. The railroads are now talking "creosoting ties," but this will only make the matter worse, because when a tie is creosoted the life is taken out of the lumber, and while it will preserve the wood from rotting, it makes the tie softer and the rail will cut in faster. White and rock oak ties cannot be creosoted; only soft woods. There is but one remedy—get a tie that will not cut in on either side, and the solution is the steel tie.

GEORGE M. COTE.

PITTSBURGH, August 11, 1909.

### The Need of Specifications for Light Steel Rails.

*To the Editor:* Of all classes of steel products requiring standardizing by the preparation of proper specifications covering the manufacture, there is one which seems to have been neglected, namely, T-rails weighing from 8 to 45 lb. per yard—the light rails used by mines, plantations, contractors and the makers of portable track. Many thousands of tons of such rails are made and sold in this country yearly. Our steel mills have large markets for this product in Cuba, Porto Rico, South America and Mexico, and this export business is growing rapidly as these neighboring countries develop.

When a buyer of light rails comes into the market with an inquiry he receives from the larger mills rolling the heavier sections a quotation on "strictly billet rolled rails." From the smaller mills, rolling the heavy sections down to light sizes, he is quoted on "strictly new rails." Consider how much the descriptions "strictly billet rolled rails" and "strictly new rails" mean. A billet may be anything in composition. It is only natural that a large mill receiving such orders should use them as a means of cleaning its yards of the odds and ends which have accumulated on account of not being sound or not meeting the specifications of the product for which they were originally intended.

Heavy rail specifications usually provide that a discard of 10 per cent. and often more be made from the top of ingots to insure solid and homogeneous metal. The large mills can agree to this without much loss, as the discard can be billeted down and put into light rails. Large mills can also put their rejected heavy rails, of which there is usually a fair tonnage, into light rails. Altogether it seems probable that a buyer of light rails from a mill rolling heavy sections will get what the mills cannot dispose of in the shape of heavy rails, with the possibility that he may get some rolled from other than rail billets and equally off grade. This is entirely for the reason, that it is not customary to buy light rails under definite specifications.

Let us consider what a buyer gets when specifying a rerolled rail from a mill rolling only light rails from rails taken up by the railroads. While he does not actually get a "strictly new rail," he has the satisfaction of knowing that the material has at one time passed the chemical or physical tests necessary to make a good rail, and in addition that any effect of crystallization which may have taken place has been removed by the heating and rerolling. In other words, he is sure of a uniform product made from steel suitable for rails, and

without flaws or defects due to segregation. There have been complaints regarding the surface appearance of rerolled rails. This, of course, is due entirely to the mill and has nothing to do with the quality. With proper rolls and rolling no one could tell the difference in appearance between a so-called "billet rolled" rail and a "rerolled rail."

QUALITY.

## The Production of Coal in 1908.

### Summary of Statistics Collected by United States Geological Survey.

The total production of coal in the United States in 1908, as reported by E. W. Parker of the United States Geological Survey, was 415,842,698 net tons, having a spot value of \$532,314,117. Of this total 74,347,102 gross tons (equivalent to 83,268,754 net tons), with a spot value of \$158,178,849, was Pennsylvania anthracite and 332,573,944 net tons, with a spot value of \$374,135,262, was bituminous and lignite.

#### Statistics by States.

The quantity of coal produced in the United States in 1907 and 1908, by States, with comparisons, are shown in the following table:

Production of Coal in 1907 and 1908, by States and Territories.

State or Territory.	Production (net tons)		Increase (+) or decrease (-), 1908.
	1907.	1908.	
Alabama .....	14,250,454	11,604,593	- 2,645,861
Arkansas .....	2,670,438	2,078,357	- 592,081
California and Alaska .....	24,089	21,862	- 2,227
Colorado .....	10,790,236	9,634,973	- 1,155,263
Georgia .....	362,401	264,822	- 97,579
Idaho .....	97,588	5,429	- 2,159
Illinois .....	51,317,146	47,659,690	- 3,657,456
Indiana .....	13,985,713	12,314,890	- 1,670,823
Iowa .....	7,574,322	7,161,310	- 413,012
Kansas .....	7,322,449	6,245,508	- 1,076,941
Kentucky .....	10,753,124	10,246,553	- 506,571
Maryland .....	5,532,628	4,377,093	- 1,155,535
Massachusetts .....		50	+ 50
Michigan .....	2,035,858	1,835,019	- 200,839
Missouri .....	3,997,936	3,317,315	- 680,621
Montana .....	2,016,857	1,920,190	- 96,667
New Mexico .....	2,628,959	2,467,937	- 161,022
North Dakota .....	347,760	320,742	- 27,018
Ohio .....	32,142,419	26,270,639	- 5,871,780
Oklahoma .....	3,642,658	2,948,116	- 694,542
Oregon .....	70,981	86,259	+ 15,278
Pennsylvania .....	150,143,177	117,179,527	- 32,963,650
Tennessee .....	6,810,243	6,199,171	- 611,072
Texas .....	1,648,069	1,895,377	+ 247,308
Utah .....	1,947,607	1,846,792	- 100,815
Virginia .....	4,710,895	4,259,042	- 451,853
Washington .....	3,680,532	3,024,943	- 655,589
West Virginia .....	48,091,583	41,897,843	- 6,193,740
Wyoming .....	6,252,900	5,489,902	- 763,088
Total bituminous .....	394,759,112	332,573,944	- 62,185,168
Penna. anthracite .....	85,604,312	83,268,754	- 2,335,558
Grand totals .....	480,363,424	415,842,698	- 64,520,726

\* Includes production of Nebraska and Nevada.

Of the 30 States and Territories which produced coal in 1907 and 1908 only three—California, Oregon and Texas—increased their output in the latter year. The increases in the first two were unimportant. The increase in Texas was due in part to the continued decrease in the production of petroleum in the State, to the rapid growth of population and to the comparatively prosperous conditions which prevailed.

#### Use of Machines.

The total quantity of bituminous coal mined by machines in 1908 amounted to 123,183,334 net tons. The machine mined product was equivalent to 37.5 per cent. of the total output of the States in which machines were employed. The machine production in 1908 was less than in 1907, but there has been a steady increase in the percentage that the machine mined coal bears to the total output of the States where mining machines have been installed, and also in the number of machines in use. The number of mining machines employed was 6658 in 1903, 7663 in 1904, 9184 in 1905, 10,212 in 1906, 11,144 in 1907, and 11,569 in 1908. The percentages of machine mined production in these years have been, respectively,

28.18, 28.8, 33.67, 35.1, 35.71 and 37.5. The average production for each machine in use in 1908 was 10,648 net tons, against 12,381 tons in 1907, 11,638 tons in 1906 and 11,258 tons in 1905, the lower average in 1908 being due to the smaller number of days the mines were worked and the decrease in total tonnage. Of the machines in use in 1908, 6380 were of the pick and puncher type, 4902 were chain-breast machines and 197 were long wall machines. These include 26 pick and 238 chain shearing machines.

Pennsylvania, the leading State in the total production of bituminous coal, leads also in the number of machines employed and in the total machine mined production, 5103 machines being employed in 1908 with a production of 52,447,809 net tons, or 44.76 per cent. of the State's total. Ohio leads in the percentage of coal mined by machines, and has for several years been second in the total quantity of machine mined coal, although West Virginia in both 1907 and 1908 had more machines in use than did Ohio. In 1908 there were 1343 machines employed in the coal mines of Ohio, and the machine mined product amounted to 19,799,140 net tons, or 75.37 per cent. of the total. West Virginia employed 1574 machines, by which 16,653,174 net tons, or 39.75 per cent. of the total, was mined. Illinois employed 1217 machines and produced 15,045,004 net tons of machine mined coal, or 31.57 per cent. of the total. Kentucky, which stands seventh in the rank of coal producing States, was second in the percentage of machine mined coal to the total in 1908, over half of the total output of the State being machine mined.

#### Coal Used for Coke and Colliery Consumption.

The quantity of coal consumed in the manufacture of coke at the mines in 1908 was 32,228,344 net tons, as compared with 50,289,822 tons in 1907, a decrease of 18,061,478 net tons, or 35.9 per cent., as compared with a decrease of 13.4 per cent. in the total production. The coal shipped to market and used in the manufacture of coke, and sold locally (which is considered a marketable product) amounted in 1908 to 399,256,861 net tons, compared with 462,802,051 net tons in 1907 and 399,323,294 net tons in 1906. The colliery consumption in the anthracite region, which consists practically altogether of culm, averages from 8 to 10 per cent. of the total anthracite output. In 1908, out of a total production of 83,268,754 net tons of anthracite, about 8,000,000 tons were used at the mines for steam and heat. The colliery consumption of bituminous coal amounts to 2 or 3 per cent. of the total production, and in 1908, out of a total of 332,573,944 tons of bituminous coal mined, 8,585,837 tons were used in the operation of the properties.

#### The Aluminum Castings Company.

A consolidation of several aluminum, brass and bronze foundry interests will be effected shortly. The first step was taken a few weeks ago when the Aluminum Castings Company of Cleveland, Ohio, was incorporated with a capitalization of \$10,000. This was followed the past week by the filing with the Secretary of State of Ohio a certificate increasing the capitalization to \$800,000.

It is announced that there will be taken over by the newly organized company the three plants of the Allyne Brass Foundry Company in Cleveland, Detroit and Buffalo, and the plants of the Eclipse Foundry Company in Detroit, Mich.; the Syracuse Aluminum Foundry Company in Syracuse, N. Y., and the aluminum castings department of the Aluminum Castings Company of America, located at New Kensington, Pa. E. E. Allyne, president of the Allyne Brass Foundry Company, is president of the new company; W. R. King of Buffalo is vice-president, and C. L. Ackerson of Syracuse is secretary.

The new company will do a general business in the manufacture of aluminum, brass and bronze castings. In addition to the operation of the plants that are being consolidated a new foundry will be erected at once in Detroit, 225 x 360 ft. Additions are now being made to the plant of the Allyne Company in Cleveland, doubling its present capacity.



## The Bureau of Standards to Supervise Steel Shipbuilding Plant for Port Arthur, Canada. Rail Tests.

WASHINGTON, D. C., August 17, 1909.—Following an important conference held at the Bureau of Standards on the 13th inst., the Federal Government has undertaken to supervise from a scientific standpoint a series of tests of steel rails to be made under the general direction of a committee of the American Railway Engineering and Maintenance of Way Association, the object being to raise the standard of rails and thereby promote the public safety. Those taking part in the conference were Assistant Secretary of Commerce and Labor Ormsby McHarg, Dr. S. W. Stratton, director of the Bureau of Standards; J. A. Atwood, chief engineer of the Pittsburgh & Lake Erie Railroad; T. H. Johnson, consulting engineer of the Pennsylvania Railroad Lines west of Pittsburgh, and A. W. Thompson, chief engineer of maintenance of way of the Baltimore & Ohio Railroad.

### Scope of Tests.

The committee of railroad engineers is planning a series of tests of steel rails with two testing machines of different types, one of which has been installed at the plant of the Maryland Steel Company, while the other is located at the Pennsylvania Steel Company's plant. While the machines are built on different principles, they are intended to reproduce as nearly as possible practical operating conditions, especially with respect to the abrasion of the rails, except that the machine is so manipulated that the wear and tear of several months of actual service can be reproduced in a few days.

In carrying out the tests that have been projected, the railroad men's committee has secured the co-operation of the leading steelmakers of the country, and at the conference held here Director Stratton also agreed to act as an associate member of the committee. The co-operation of these three elements, it is believed, will result in a series of tests that for thoroughness and accuracy will excel anything of the kind heretofore attempted either in this country or abroad. The steelmakers have given much attention to the subject of producing better rails, but have not possessed the facilities nor the technical knowledge to test their rails under practical conditions. The railroad men, while in position to make tests under service conditions, have lacked the opportunity to supervise closely the chemical and physical tests carried on by the steelmakers in the production of rails. Under the agreement reached with Director Stratton the facilities of all the appropriate laboratories of the Bureau of Standards will be placed at the disposal of the committee, and every feature of the prospective tests will be supervised, checked and recorded by the most accomplished Government experts in their several lines.

### Valuable Data to be Obtained.

The supervision of the work by the bureau's experts will begin with the determination of chemical composition, and special attention will be paid to the physical tests and to the treatment of the steel in process of manufacture. In the opinion of Director Stratton, there is greater opportunity for the acquisition of valuable information regarding the effect of treatment than with respect to any other detail of manufacture, and he also believes that the refinement of the methods of measuring heat and greater accuracy in recording the processes of treatment will be found to produce unexpectedly important results.

A feature of the bureau's work in this connection will be the testing of steels of a great variety of alloys, and it is probable that the results deduced will have an application much broader than the immediate object of this investigation. It is understood that the tests will begin at an early date, and will be carried forward as rapidly as possible. They will necessarily occupy an extended period as an important feature of the work will be the testing of rails of various chemical composition, physical characteristics, weights and cross sections in actual service on the principal roadbeds throughout the country.

W. L. C.

TORONTO, August 14, 1909.—By an almost unanimous vote on Tuesday the rate payers of Port Arthur ratified the by-law to give effect to the agreement between the City Council and the Western Dry Dock & Shipbuilding Company. By this agreement the company on its part contracts to build, equip and operate in the city, first, a dry dock capable of receiving and handling the largest vessels plying on the Great Lakes, and, second, a shipbuilding plant adequate for the constructing and equipping of such vessels. The building of these works is to be begun within two months of the date of ratification by the rate payers, or of the date of the passing by the Provincial Legislature of an act empowering the municipality to enter into the agreement, should the authority of such an act be found to be necessary. Both dry dock and shipbuilding plant are to be ready for operation on September 1, 1911. At least 300 hands are to be kept in steady employment in the works. A site of 100 acres, designated in the Strathcona property, which is owned by the city, is to be provided free of cost to the company, along with suitable water frontage on Thunder Bay.

All of the property of the company is to be exempt from taxation, except for school purposes, and the school taxes are fixed at \$2000 per annum for 20 years. For the first 10 years of the company's operations it is to receive from the city an annual cash subsidy of \$25,000, but if fewer than 300 hands are kept at work in any year the subsidy shall be such ratio of the \$25,000 as the number of hands actually engaged bears to 300. However, the company may in years subsequent to any in which its hands are not up to the specified number employ hands in excess of that number, and thus earn the portion of the subsidy it fell short of in a previous year. The subsidy is to be solely for the operation of the plants, and no part of it can be earned by the work of erecting and installing them. The city undertakes the building, or to procure the building by the Government, of adequate breakwater protection. The works are to cost in the neighborhood of \$1,000,000, though in the agreement no mention is made of the sum to be laid out on their account.

It is expected that the establishing of these works will give a marked additional impulse to the industrial growth of Port Arthur. Standing at the head of navigation, the city ought to be an advantageous point for works in which the building and repairing of ships for the Great Lakes is carried on. Hundreds of millions of dollars have been expended upon the construction of railroads from Fort William and Port Arthur into the interior of western Canada, and very large amounts have been laid out on terminal accommodations in these twin cities. If there is to be a development of the Canadian means of lake transportation commensurate with the development of the Canadian means of rail transportation, then the building and repairing of ships at Port Arthur should be a well sustained industry. It is true, the shipbuilding industry in Canada is not fostered by the Government, as the interests engaged in it consider that it ought to be, but it is expected that Parliament will soon provide for the encouragement of the industry by the enactment of a bounty law. Public opinion has been turned to the favorable consideration of this policy by the agitation for a coast defense system. But if the Government does not yet assist shipbuilding it does give substantial aid in the construction of dry docks. Three per cent. per annum will be paid by the Government on the cost of a dry dock that is approved by the Minister of Fisheries and Marine. In no case, however, is the subsidy to exceed \$45,000 per annum. C. A. C. J.

The purchasing and sales departments of the Colonial Steel Company have been moved from Colona, Pa., to the twelfth floor of the Keystone Building, Pittsburgh. The office of the superintendent and the works management will continue to be located at Colona, Pa., on the Pittsburgh & Lake Erie Railroad, as heretofore.

## The Production of Manganese and Manganiferous Ores in 1908.

The conditions governing the manganese mining industry showed no improvement in 1908 over those of 1907, according to the forthcoming annual report of the United States Geological Survey; in fact, fewer mines were in operation during 1908 than in the previous year, no shipments being made from Western States. Manganese ores were mined in Arkansas, California, South Carolina and Virginia, but only from Virginia were any shipments reported. Eleven mines were in operation during the year, and of these seven shipped a part or all of their product, amounting to 6,144 gross tons. The Virginia shipments were nearly all from the Blue Ridge district. With the exception of about 30 tons used in the steel industry, all the ore mined was used for chemical purposes, largely in brick manufacture. The percentage of metallic manganese in the domestic ores produced in 1908 varied from 40 to 50 per cent.

As in 1907, the imports in 1908 far exceeded the domestic production and amounted to 178,203 gross tons, most of which was used in the manufacture of ferromanganese and spiegeleisen. A considerable quantity of imported ore is used in the manufacture of dry cells, and a small quantity is used for coloring purposes.

In addition to the 6,144 tons of domestic ore shipped, 4,345 tons were mined and remained as stock at the mines at the end of the year. At a few localities, the operations consisted only in doing assessment work.

### Output of Manganiferous Ores.

Considerable quantities of manganiferous ores were mined in 1908, including manganiferous iron ores and manganiferous silver ores. The former were of low grade, and, except a small production in Virginia, were not utilized for their manganese content. For the most part, they contained less than 6 per cent. metallic manganese and simply yielded a high manganese pig iron. The manganiferous iron ores mined in 1908, amounting to 471,480 gross tons, were derived from the Lake Superior district and from Arkansas and Virginia. Manganiferous silver ores were mined in the Western States in connection with lead, zinc and precious metals. A small quantity (15,973 tons from Leadville) was used in the manufacture of spiegeleisen, and a larger quantity (39,647 tons) was reported as being used for flux in the copper and silver smelters. Probably a much greater quantity was used for the latter purpose than has been reported.

The production of manganiferous zinc residuum from New Jersey zinc ores in 1908 amounted to 110,225 tons, which is considerably greater than the production during any preceding year.

### Prices.

The prices of manganese ores used in the steel industry vary from \$5 to \$15 per gross ton, according to the grade of the ore. They are governed by the following schedule of prices established by the Carnegie Steel Company:

Schedule of prices paid per ton of 2240 lb. for domestic manganese ore delivered at Pittsburgh or Bessemer, Pa., and South Chicago, Ill.:

Prices are based on ores containing not more than 8 per cent. silica or 0.25 per cent. phosphorus, and are subject to deductions as follows: For each 1 per cent. in excess of 8 per cent. silica there shall be deduction of 15 cents per ton; fractions in proportion.

For each 0.02 per cent. or fraction thereof, in excess of 0.25 per cent. phosphorus, there shall be a deduction of 2 cents per unit of manganese per ton.

Percentage of metallic manganese in ore	Price per unit in cents.
	Manganese. Iron.
Over 40.....	30 6
46 to 49.....	29 6
43 to 46.....	28 6
40 to 43.....	27 6

Ores containing less than 40 per cent. manganese or more than 12 per cent. silica or 0.27 per cent. phosphorus are subject to acceptance or refusal at the buyer's option.

Settlements are based on analysis of sample dried at 212 degrees F., the percentage of moisture in the sample as taken being deducted from the weight.

The manganese ores for oxidizing and coloring purposes are valued according to the quantity of man-

ganese peroxide present, their consistency, &c., and prices range up to \$25 per ton for the better grades of ore. Manganiferous ores used in steel manufacture and for fluxing range in price upward from \$2 per ton.

### Imports.

During 1908 there were imported into the United States 178,203 gross tons of manganese ore, valued at \$1,350,223, 209,021 tons in 1907, valued at \$1,793,143, showing a decrease in both quantity and value for the imports during 1908. On account of the small domestic production and the small portion even of this product used in making spiegeleisen and ferromanganese, the importation of foreign manganese ores is a matter of increasing importance as the iron and steel industry in this country develops. By far the larger portion of the imported manganese ore was obtained from India, where large deposits have been developed in the last few years and new ones are still being found. Brazil furnished considerable ore, and small quantities were imported from Cuba, France, Japan and Germany.

## Advocating an Export Duty on Newfoundland Iron Ore.

TORONTO, August 16, 1909.—From time to time the question of putting an export duty on Newfoundland ore crops up in the colony. Since the defeat of Sir Robert Bond in the general elections a few months ago there has been some conjecture as to the course the new Government will adopt in this matter. In the past the idea of an export duty on iron ore has been advocated from two standpoints, one for the domestic industrial development of the colony's resources, the other for the raising of revenue. In a letter published in the *Evening Herald* of St. Johns, Hon. John Anderson, a leading public man in the island, urges that the Board of Trade in that city make its influence felt with the Government. A state of affairs which ought, he considers, to be pressed upon the attention of the Government by the board is that the country is not getting adequate returns for the raw materials it is parting with. Take, he says, the case of Bell Island, which he describes as one of the greatest of Newfoundland's assets. Ore from that island is, according to his information, being shipped out of the country at the rate of 40,000 tons a week. This, he says, ought to be yielding a tax of at least 25 cents a ton in order to find money for the colony's educational grant. He thinks the companies that are taking the ore from Bell Island must feel that the Government of Newfoundland is rather stupid.

Possibly the discovery, made as a result of recent explorations, that the ore body on Bell Island is greater than it was formerly supposed to be, and that it has a considerable submarine extension, may have something to do in the reviving of this call for an export duty. Apart from that, there is growing desire for the more general utilization at home of raw materials produced there. This desire has been whetted by the enterprise of the Harmsworths in building great works for the manufacture into product of their timber on their pulp wood limits in Newfoundland. If the iron ore was subjected to an export duty of 25 cents a ton, the impost would be unwelcome to the companies by which the Bell Island deposit is mainly owned. These are the Dominion Iron & Steel Company and the Nova Scotia Steel & Coal Company. Their furnaces being in Nova Scotia, the ore could not be carried thither except upon the payment of the export duty.

C. A. C. J.

The West Leechburg Steel Company, Farmers' Bank Building, Pittsburgh, Pa., is calling attention to the fact that it has added to its hot and cold rolling mills at Leechburg, Pa., equipment for the manufacture of steel hoops and light bands. Having its own open hearth furnaces and forge department, it is enabled to produce steel of special composition to meet exacting requirements and can furnish a superior quality of hot or cold rolled strip products made from hammered blooms.



## PERSONAL.

James J. Flannery, president of the American Vanadium Company, Pittsburgh, accompanied by his son, Walter Flannery, and engineers, is in Peru looking after the company's mining operations. He will remain there until about October 1.

Charles Dabney, stock foreman of the Valley Works of the Republic Iron & Steel Company, Youngstown, Ohio, has been appointed night superintendent of that works to succeed Clifford Brewer, resigned.

Benjamin R. Western and W. Hull Western, until August 1 respectively proprietor and manager of the Manufacturers' Advertising Bureau, 237 Broadway, New York, and Walter Mueller and W. H. Denney, until August 1 respectively president and treasurer of the Banning Company, 225 Fifth avenue, New York, have organized the Manufacturers' Publicity Corporation. Benjamin R. Western is president; Walter Mueller, vice-president and general manager; W. H. Denney, treasurer, and W. Hull Western, secretary. The offices are located in the Hudson Terminal Building, 30 Church street, New York.

Herman B. Cox, assistant to the president of the Empire Steel & Iron Company, Catasauqua, Pa., who was seriously injured at the blowing in of the company's Oxford, N. J., furnace July 26, is making rapid progress toward recovery. In bringing the gas down under the boilers a violent explosion occurred. A cleaning door was blown off which struck Mr. Cox, causing a fracture of the skull and crushing a portion of one foot.

J. R. S. Blaine, designer for the Berlin Machine Works, Beloit, Wis., has gone abroad to investigate practice in Germany, France and England and superintend the erection of machinery sold by his company.

J. E. McAfee, Michigan manager for the William B. Hough Company, Chicago, dealer in construction machinery and reinforcing steel, who has been operating the territory consisting of the State of Michigan from the Chicago office of the company, has established his headquarters at Detroit.

E. V. Brigham, secretary and treasurer of the Union Sanitary Mfg. Company, Noblesville, Ind., has gone to the Pacific Coast, where he will cover all points in the interest of his company. A substantial increase of business has been enjoyed by the company every month this year.

O. Wedemeyer of Thyssen & Co., Mülheim a. d. Ruhr, Germany, is in the United States visiting a number of important steel works and machinery manufacturing plants.

George H. Wadsworth, superintendent of the Falls Rivet & Machine Company, Cuyahoga Falls, Ohio, sailed August 18 on a visit to his old home, England, and also on business in England, Scotland, France and Germany in connection with the Wadsworth improved core making machines and equipment manufactured by his company.

**A Modern Steel Roll Foundry.**—The United Engineering & Foundry Company, Pittsburgh, Pa., presents in a pamphlet of unusual typographical and illustrative merit a description of its steel foundry at Vandergrift, Pa., with interesting data on the work of its steel casting department. There are 35 illustrations, some of them full page, which give a good idea of the exterior and interior equipment of the steel foundry and of its processes and principal products. The latter include steel rolls and mill pinions, machine molded steel gears, engine, locomotive, car and bridge castings, miscellaneous rolling mill and machinery castings and annealing boxes. The capacity of the steel foundry is 2000 tons a month, rolls constituting an important tonnage. As regular heats of high carbon steel are taken for rolls, the company is in position to make prompt deliveries of hammer dies and other castings requiring special carbons. For roughing rolls the carbon content ranges from 0.40 to 0.65 per cent., and for finishing rolls from 0.85 to 1.25 per cent. The company's experiments with cast steel annealing

boxes have resulted in the development of a multiple dome annealing box with corrugated sides. This design counteracts the warping and sagging tendencies of the box in heating and cooling. Illustrating the necessity for proper annealing of steel castings, the pamphlet gives photographs of polished and etched specimens showing the structure of the steel as cast, also that of a well annealed casting, and that of an overannealed casting. Among the castings illustrated are machine molded gear rims 18 ft. in diameter, with spiders, and a 60,000-lb. base casting for a bridge. The company maintains a well equipped laboratory.

## OBITUARY.

RODERICK PERRY CURTIS, president of the Curtis & Curtis Company, Bridgeport, Conn., died August 9, at Southport, Conn., the result of an automobile accident which occurred several weeks ago in the vicinity of Westerly, R. I. He did not show the effects of his injuries for several days. Specialists were called in as his condition became more and more serious, and trepanning was finally resorted to, but without success. Mr. Curtis was born in New York in 1860. The family moved to Southport in 1868. With William D. Forbes, in 1882, he founded the firm of Forbes & Curtis to manufacture the Forbes patent die stock. In 1887 Mr. Forbes' interest was taken by Lewis B. Curtis, a brother, and the firm of Curtis & Curtis formed to continue the business. In 1900 the firm was incorporated. Mr. Curtis was secretary and treasurer of the Connecticut Golf League, being an enthusiastic golfer. He was treasurer of the Pequot Library, in which he took an active interest, and was prominent in social affairs, being a member of the State Board of Trustees of the Sons of the American Revolution and member of the New York Yacht Club, Bridgeport Yacht Club, Algonquin Club, Brooklawn Country Club, New Haven Country Club, Commercial Club of Charleston, S. C., Manufacturers' Association of Bridgeport, &c. He was also director of several manufacturing corporations. He leaves a widow and three children, the eldest being a son who was recently graduated from Yale.

HERMAN P. SCHUYLER, assistant treasurer of the General Electric Company, Schenectady, N. Y., and one of the best known credit men in the country, died at his home in Albany, August 14, aged 66 years. He was born in Albany, and was a direct descendant of General Schuyler of Revolutionary fame. At the outbreak of the Civil War he went West and enlisted in the First Wisconsin. In 1864 he was appointed head of the Ordnance Department, with headquarters at the Watervliet Arsenal, which position he resigned 1870 to enter the employment of the Troy Steel & Iron Company. In 1887 he became private secretary to the late H. H. Rogers. In 1890 he was appointed head of the sales department of the Wellman Steel & Iron Company, Thurlow, Pa. In 1893 he was appointed to the position he held at the time of his death. He was a member of the Fort Orange Club of Albany, Troy Club of Troy, Army and Navy, the Loyal Legion and the Holland Society of New York. He leaves a son and a daughter.

JOSEPH D. DU BOIS, Wheeling, W. Va., died August 9, aged 82 years. He was born on a farm in Jefferson County, Ohio; for many years was interested in steamboat navigation on the Ohio River, and in 1864 began his connection with the iron trade through his election as secretary of the Belmont Iron Works. He continued to hold this office until the organization of the Wheeling Steel & Iron Company in 1892. He was then elected secretary of that company and held the position until January, 1899, when he resigned and retired from active business.

The United Steel Company, Canton, Ohio, has just received an order from the Ford Motor Company, Detroit, for 5000 tons of vanadium steel, and recently received contracts from the Government for vanadium steel for the manufacture of rifle barrels. It is stated that the company now has enough orders on its books to take all of its production for the balance of the year.

### The Production of Fluorspar in 1908.

The fixing of a duty of \$3 per gross ton on fluorspar, so largely used in the steel industry, invests with special interest the annual report of the United States Geological Survey which records a substantial reduction of output during 1908 when the total was 38,795 net tons, valued at \$225,998, as compared with 49,486 tons, valued at \$287,342 in 1907.

Three States, Colorado, Illinois and Kentucky, and one territory, Arizona, produced fluorspar in the year 1908, Arizona having again become a producer for the first time since 1904. The production in Colorado and Kentucky decreased; that of Illinois showed an increase. No production has been reported from Tennessee since 1906. Colorado produced gravel spar and Arizona lump spar; the total quantity produced was 745 net tons. Illinois produced 21,332 net tons of gravel spar and 6189 tons of lump spar. Kentucky reported a total production of 6323 tons.

The financial stringency of the last quarter of 1907 seriously affected the fluorspar industry far into the year 1908. Several mines in Kentucky and Illinois which have been steady producers for years were idle throughout 1908. Others which were operated at less than their full capacity during the first half of 1908 were obliged practically to close down during the late summer and autumn on account of low water in the Ohio River, a condition which prevented supplies being brought in and spar being shipped out of all places dependent on river transportation.

The demand for fluorspar necessarily depends primarily on the activity of the steel industry, as it is estimated that fully 80 per cent. of the production is consumed by this industry and chiefly in the basic open-hearth charges.

Low prices during 1908 resulted in the accumulation of considerable stocks of spar at the end of that year. At the Illinois mines there were 3065 tons in stock, and in Kentucky 12,899 tons remained unsold at the close of 1908. Better conditions have prevailed during the first half of 1909 in the industries on which fluorspar mining is dependent, and the orders booked by the producing companies indicate that the trade for 1909 will be more nearly normal.

The annual production of fluorspar in the United States since 1900 is given in the following table:

Tons.	Value.	Tons.	Value.
1901.....19,586	\$113,803	1905.....58,385	\$362,488
1902.....48,018	271,832	1906.....40,796	244,025
1903.....42,523	213,617	1907.....49,486	287,342
1904.....36,452	234,755	1908.....38,795	225,998

Heretofore fluorspar has been imported into the United States duty free, and it has, therefore, been impossible to obtain statistics of the importations. Large quantities of gravel spar produced at a low cost from the tailings of lead mines and from the gob in abandoned mines in England has been shipped to this country as ballast at a very low freight rate. The material thus produced is high in silica and competes with the American gravel spar in the Eastern States, as far west as Pittsburgh, and practically fixes the market price. According to Fohs, the imports of English spar in the United States in 1906 probably reached 30,000 net tons. The same authority states that the total freight cost of spar from English mines to American ports is about \$2.50 per ton and only \$1.60 additional to Pittsburgh. It is estimated that the imports of fluorspar from Great Britain and all other countries in 1908 were not in excess of 22,000 net tons.

The Baltimore Bridge Company, Baltimore, Md., has made a number of shipments recently direct from Baltimore for the Isthmian Canal Commission, comprising steel work for buildings and collapsible steel concrete forms. The company will ship this week a 400-ton bridge by special steamer from Baltimore to Costa Rica. The same company is now furnishing and erecting the steel work for four buildings in New York City, including the new B. P. O. E. club house on West Forty-third street.

### Boiler Inspection Departments Organize.

Delegates from the State and municipal boiler inspection departments of Detroit, Mich.; Nashville, Tenn.; Providence, R. I.; Omaha, Neb.; Los Angeles, Cal.; Denver, Colo., and Minneapolis, Minn., met in Detroit recently and perfected an organization of boiler inspection departments. The primary objects of this organization are the promotion of uniform inspection methods and boiler construction, and the facilitation of exchange of ideas and experiences.

The organization will be known as the National Association of State and Municipal Boiler Inspection Departments. The officers chosen are as follows: J. C. McCabe, Detroit, president; Chas. E. Doyle, Providence, R. I., first vice-president; Philip McCarty, Denver, Colo., second vice-president; M. J. Close, Minneapolis, Minn., third vice-president; M. N. Brien, Nashville, Tenn., secretary; Robert U. Wolfe, Omaha, Neb., treasurer; F. E. Griesmer, Los Angeles, Cal., chairman Committee on Rules.

This movement has the hearty approval of the American Boiler Manufacturers' Association. It will be the aim of the organization to meet annually to promote the growth of the organization and extension of uniform practice in inspection and construction. It is a matter of notoriety that with few exceptions the municipal boiler inspection departments throughout the country have been exceedingly inefficient. The growth of this movement will do much to promote public safety and uniformity in methods.

### Customs Decisions.

#### Composition Metal.

The Board of United States General Appraisers has decided a controversy between F. B. Vandegrift & Co. and the Government regarding the classification of pigs of composition metal in favor of the latter. Copper and lead are the chief elements in this metal on which duty was assessed at the rate of 45 per cent. under the provision in the Dingley tariff for a manufactured article composed wholly of metal. The importers maintained that the pigs were free of duty as "brass," or else entitled to enter as "metals unwrought" at 20 per cent. It was shown at the trial of the case that the metal contained 65.39 per cent. of copper and 28.40 per cent. of lead.

General Appraiser Fischer, in his decision for the board, says that the tribunal is of the opinion that an alloy of this character, containing so large a proportion of lead, is not, in fact, the commercial article known as brass, and for which provision is made in paragraph 505. Neither is the board inclined to uphold the importers' claim for a 20 per cent. duty as "unwrought metals." In overruling the protests, Mr. Fischer says in part:

These composition metals are not brasses, and we hold that an alloy of copper containing over 28 per cent. of lead is likewise not a brass. In its imported condition the article is a metal in the form of an alloy used solely as a raw material to make bearings and various forms of castings. We do not regard this metal dutiable properly as assessed. We are inclined to the belief that the provision for "all composite metal of which copper is the component material of chief value," to which the protest makes no reference, supplies a more specific designation for this metal alloy than paragraphs 183 or 193.

**Correction.**—The American Coal Washer Company, Alton, Ill., calls attention to an error in a reference made to the coal washing plant supplied by this company to the Superior Coal Company, Gillespie, Ill., which appeared on page 408 of *The Iron Age* of August 5. The capacity of the washer is 2560 tons in 8 hr. and not 256 tons as printed.

The Alliance Machine Company, Alliance, Ohio, has received a contract for four ladle cranes for the open hearth plant, two of 150-ton capacity and two of 50-ton capacity, which will form part of the new works of the Jones & Laughlin Steel Company at Allquippa, Pa. The Morgan Engineering Company, Alliance, received the contract for five cranes for the open hearth blooming mills.



## NEWS OF THE WORKS.

## Iron and Steel.

The Portsmouth Steel Company, Portsmouth, Ohio, which is making some improvements to its plant, has awarded a contract to the Wheeling Mold & Foundry Company, Wheeling, W. Va., for two 75-hp. induction reversing drives for the tables which it is having built for its new billet mill.

Furnace No. 2 of the Birmingham Coal & Iron Company, at Vanderbilt, Ala., is being relined and will probably be ready for operation within 60 days.

Announcement is made by H. S. Chamberlain of the Citico Furnace Company, Chattanooga, Tenn., that operations at the furnace plant will be resumed by September 1.

Moorhead, Brother & Co., Inc., Pittsburgh, manufacturers of skelp, tank iron, floor plates, &c., are again operating their plant at Sharpsburg, Pa. The puddling department is running nearly full, and the 100-in. plate mill is also being operated. Considerable business has been booked, insuring operations for the future.

The business of the Jackson Mfg. Company, Worcester, Mass., has been incorporated with a capital stock of \$75,000, under the name of the Jackson Wire Mfg. Company, with a view of extending its business, the present quarters being entirely too small to take care of the increasing demand for its products. The company intends to secure a location in or near Worcester and has two or three mills under consideration. The business has been established for 35 years, the products including round wire of iron, steel, copper, brass, bronze and aluminum up to 1 in. in diameter. C. S. Ellis is president; C. B. S. Jackson, superintendent, and G. W. Jackson, treasurer.

Newspaper reports to the effect that mill operations would commence this week at the new plant of the West Penn Steel Company, Brackenridge, Pa., are untrue. A charging machine and some other equipment have to be installed first. The company does not expect to manufacture sheets commercially until about October 1. In the meantime the furnaces and mill equipment are to be tried out.

The Russell, Burdall & Ward Bolt & Nut Company, Rock Falls, Ill., has let contracts for the construction of two new buildings, one of which will be three stories, 60 x 150 ft., with a total floor space of 50,000 sq. ft., and the other one story, 75 x 145 ft. These buildings, which the company expects to have ready for occupancy by December 1, will nearly double the capacity of the present plant. Contracts for the equipment of the buildings have been let.

After being idle since about July 1, pending the settlement of the puddling and wage scale, the Kittanning Iron & Steel Company, Kittanning, Pa., is again operating its iron mill. Twenty-one puddling furnaces are running. The repairs to the company's Rebecca Furnace are coming along satisfactorily, and it will be ready for blowing in this fall.

The Zug Iron & Steel Company, operating the Sable Iron Works, Pittsburgh, last week placed in operation the bar mill. The puddling and sheet departments have been working for some time, and business with the company is showing an increase.

## General Machinery.

McCoy & Brandt, manufacturers' agents, Ferguson Building, Pittsburgh, have recently installed in the new plant of the West Penn Steel Company, Brackenridge, Pa., complete equipment for the mill tables, consisting of Allen-Bradley indestructible graphite resistance controllers and motor starters, ranging from 5 to 50 hp., together with shears, machine shop tools, &c.

The Chicago, St. Paul, Minneapolis & Omaha Railroad will need a new pump and filtering plant at Pipestone, Minn., where the water supply station recently burned.

The Chicago, South Bend & Northern Indiana Railroad is having plans prepared for machine and repair shops, car house, &c., which it expects to erect at South Bend, Ind. Chas. Murdock, South Bend, is vice-president.

The Lawrence Machine Company, Lawrence, Mass., has been petitioned into bankruptcy. The liabilities are stated to be about \$50,000.

It is understood that the Fire and Water Board of Kansas City, Mo., is to spend about \$16,000 for the erection and equipment of a machine shop at the Turkey Creek station.

The new plant to be built at Schenectady, N. Y., by the Climax Specialty Company, Seneca Falls, will consist of a foundry, 40 x 146 ft.; machine shop, 40 x 200 ft., with L and office building, 35 x 35 ft., all of brick, concrete and structural steel. The company manufactures plumbers' specialties.

The Crocker-Wheeler Company, Ampere, N. J., has recently received an order from the Indiana Steel Company, Gary, Ind., for 70 mill motors totaling about 2400 hp. This is in addition to the 11,000 hp. of Crocker-Wheeler motors employed at the present time by this company. Other orders include Gould Paper Company, Lyons Falls, N. Y., electric drive for new paper making machine; J. H. Kohler Sons Co., Sheboygan, Wis., 750-kw. generator; King Bridge Company, Cleveland, Ohio, 150-

kw. compound wound generator; Bethlehem Steel Company, South Bethlehem, Pa., 220-hp. compound wound motor for its Saucon plant; Roessler & Hasslacher Chemical Company, Perth Amboy, N. J., 295-hp. of motors of the squirrel cage type.

The Owens Bottle Machine Company, Toledo, Ohio, intends to build a new plant in West Virginia, the location for which has not yet been definitely decided.

## Bridges and Buildings.

The Vulcan Iron Works, Seattle, Wash., has let contracts for the erection of six new buildings and contracts for three more will be let later on.

The United Iron Works Company, Springfield, Mo., has received a contract for furnishing the structural iron and steel for the 55 Government buildings to be erected on the military reservation at Fort Sill, near Lawton, Okla. The company is especially well equipped for turning out this character of work and was awarded this contract in competition with all the leading structural firms of the country. Part of this work will be turned out at the Pittsburg, Kan., plant of the company.

The Independent Bridge Company, Pittsburgh, has been awarded a contract for furnishing and erecting two 95-ft. bear traps in Dam No. 8, Ohio River, at Wellsville, Ohio., and for supplying and erecting a number of gates to be placed in the Tennessee River in Alabama. The gates are of heavy structural steel construction, each section being 45 x 45 ft.

## Foundries.

La Rue Bossart and J. F. Abernethy have taken over the foundry of the Paxton Foundry & Machine Company. The new owners will do all kinds of repair and jobbing work, and will in the near future install equipment suitable to this line of work.

The Lynchburg Foundry Company, Lynchburg, Va., has just completed a small addition to its foundry and is extending its warehouse. No new machinery will be required.

The Maxwell-Briscoe Motor Company, Tarrytown, N. Y., has begun the construction of a brass foundry 70 x 80 ft., arranged so that additions can be made at any time. The company intends to make its own brass and aluminum castings and the foundry will have a capacity of 7 tons a day. The new additions to the Rand shops, recently purchased, are expected to be ready for occupancy in about six weeks.

The Beggs Pipe & Foundry Company, at North Birmingham, Ala., has resumed operations at its soil pipe plant.

## Power Plant Equipment.

The Oswegatchie Hydraulic Power Company has been incorporated at Carthage, N. Y., with a capital stock of \$100,000, and will build a plant for generating electricity. Mark S. F. P. and M. C. Wilder of Carthage are the incorporators.

The Hydro-Electric Power Commission has awarded to Witchall & Son, Toronto, contract for transformer station at Toronto for \$36,500 and for transformer station at London, Ont., for \$23,500. John Hayman & Sons, London, Ont., have submitted a bid of \$148,000 for the eight stations required at Woodstock, Paris, Berlin, Stratford, St. Marys, St. Thomas, Preston and Guelph.

The Great Northern Railroad is said to be contemplating the erection of a power plant at Leavenworth, Kan.

The Jamestown Iron Works, Jamestown, N. Y., will construct a hydro-electric plant to provide electric power for the operation of its machine shop and foundry. The Dayton Globe Iron Works, Dayton, Ohio, will furnish a 22-in. water turbine and the Jamestown Boiler Works will build a 30-in. steel flume for the plant.

A pumping plant is to be erected in the vicinity of the smelters at Bingham Cañon, Utah, by the Independent Water Company of Salt Lake City, recently incorporated for that purpose.

The Range Power Company is having plans drawn for pumping stations to be built at Hibbing and Chisholm, Minn.

C. A. Short, Modena, Utah, will be in the market before long for power machinery to be installed at the mine in which he is interested.

Pumping machinery will be purchased shortly by the Roundup Water Company, recently organized at Roundup, Mont.

From De Beque, Colo., it is reported that E. A. Swenson of Colorado Springs is having plans prepared for a hydro-electric plant to be constructed there.

The Preston Power Company, of which F. E. Carver, Brandonville, W. Va., is president, has been formed to build a hydro-electric plant on Saney Run.

It is stated that the city of Madisonville, Ky., has rejected bids for the installation of machinery in the electric light plant and will invite new bids for a 200-kw. generator, engine and 150-hp. boiler.

Advices from Great Falls, Mont., state that G. H. Jay of that place will erect a hydro-electric power plant in the vicinity of St. Maries, Idaho.

James E. McNary, Machesney Building, Pittsburgh, sales agent for the Clark Brothers Company, Belmont, N. Y., has re-

ceived an order from the Pittsburgh Expanded Metal Company, Economy, Pa., for a 200-hp. Clark horizontal gas engine, being a duplicate of one installed some time ago.

Fayette, Ohio, will take bids this month on an electric generating plant.

#### Fires.

The plant of the Buckeye Rubber Company, Akron, Ohio, was partially destroyed by fire August 12. The loss is estimated at \$100,000.

The copper rolling mill of Hendricks Bros., Belleville, N. J., was burned August 13, the loss being about \$60,000.

The plant of the New England Quartz Company, Roxbury Falls, Mass., was burned August 13, with a loss of \$75,000.

The plant of the Empire Graphite Company at Porter's Corners, near Saratoga, N. Y., was destroyed by fire August 13. The loss is estimated at \$70,000.

The machine shop of Kelch Brothers at South River, near New Brunswick, N. J., was burned August 5, with a loss of \$3000.

The plant of the Reading Abattoir Company, Reading, Pa., was destroyed by fire August 12, the loss being about \$50,000.

The plant of the Wheeling Metal & Mfg. Company at Wheeling, W. Va., was burned August 12, with a loss of \$30,000.

The morocco manufacturing plant of A. B. Hoffman & Sons, Lynn, Mass., was burned August 11, with a loss of \$150,000.

The repair shop of the Canadian Pacific Railroad at Nelson, B. C., was burned August 6. The loss is placed at \$10,000.

The bar mill of the Logan Iron & Steel Company at Burnham, Pa., was damaged by an explosion August 12. The loss is stated to be about \$15,000.

The plant of the Jacob Dold Packing Company at East Buffalo, N. Y., was partially burned August 12, the loss being about \$50,000.

#### Hardware.

The Northwestern Novelty Company, Morris, Ill., has been incorporated, with a capital stock of \$3000, to manufacture hardware specialties, among which are a cigar clipper and match lighter. The incorporators of the company are Emerson A. Bolen, K. H. Bolen and Earl D. Fuller.

The Acme White Lead & Color Works, Detroit, Mich., is building a three-story addition, 60 x 160 ft., to its plant.

The Stimple Mfg. Company, Geneva, Ill., has been organized, with a capital stock of \$15,000, to manufacture grain cleaning and grading machinery, agricultural implements and specialties. This company is the outgrowth of a smaller company of the same name which has been making the Uncle Sam corn grader. The company is now equipping a new plant which will greatly increase its output.

#### Miscellaneous.

W. W. Wheeler, Great Falls, Mont., and others have formed the Montana Engineering Company and will engage in heavy construction work.

The Joplin Furnace & Mfg. Company, Joplin, Mo., manufacturer of the Great Circle and Lake Shore hot blast furnaces, is erecting a branch plant at Muskogee, Okla., to be used as a cornice and sheet metal factory. Nearly all the machinery necessary to equip this plant has been purchased.

The Imperial Porcelain Works, Trenton, N. J., is to rebuild its plant, which was recently destroyed by fire. Not much new machinery will be required except some of special nature, which has already been ordered. The power plant was not burned.

A West Virginia charter has been granted H. A. Danne, J. D. Madigan, Wash. Herd, D. D. Fretts and J. A. Dewitt, all of Connellsville, Pa., for a new corporation, to be known as the United States Aluminum Company of Connellsville, Pa., the capital of which is \$100,000.

The Gary Motor Car Company, Muskegon, Mich., has let contract for the construction of its factory to the Olson Construction Company.

The Michigan Safety Furnace Pipe Company, Detroit, Mich., will build and equip a three-story factory at Bohemia and Second avenues. Walter Winch, 220 Abbot street, is secretary.

The new electric smelting plant of the British Canadian Smelters, Ltd., at Chippewa, Ont., near Niagara Falls, built to replace the plant recently destroyed by fire, has been completed and is now in full operation.

The J. F. Tillery Iron Company, recently incorporated, has succeeded to the business of J. F. Tillery & Co., Knoxville, Tenn., who have carried on a general wholesale business in rails, railway equipment, rolling stock, iron and steel scrap, &c., for the past five years. It is the intention of the company to extend its business over the entire South, but it does not intend to go into manufacturing. J. F. Tillery is president and manager, F. B. Tillery, vice-president, and R. M. Tillery, secretary and treasurer.

In order to take care of its rapidly increasing business the Onward Mfg. Company, Menasha, Wis., manufacturer of the Onward sliding furniture shoes, is erecting a new factory build-

ing, 40 x 110 ft., of concrete construction. All machinery required for glass making and utensils has been purchased, but it is likely that the company will be in the market for individual electric motors, by which all machinery is to be operated.

The National Mfg. Company, North Side, Pittsburgh, has been awarded the contract for installing the entire annealing equipment for the McKeesport Tin Plate Company, McKeesport, Pa. The contract provides for supplying all boxes and bottoms and to make all repairs to the same until December 31, 1910. The company manufactures a welded annealing box which is reinforced with the Johnson patent protecting strip, which permits of the boxes being renewed, thus prolonging the usefulness of them considerably.

The Geo. W. Bartlett Rotary Engine Company has been incorporated at Tacoma, Wash., with \$300,000 capital.

The Niagara Electro Chemical Company, Niagara Falls, N. Y., is receiving bids for the laboratory and shop buildings, 52 x 118 ft. and 40 x 140 ft., two stories, which it will erect at once, of brick, reinforced concrete and structural iron.

The capital stock of the Wood Electric & Mfg. Company, South Bend, Ind., has been increased from \$10,000 to \$50,000.

### The National Enameling & Stamping Company.

The National Enameling & Stamping Company's annual report for the 12 months ended June 30 shows an increase in net profits of \$547,749. After allowing for dividends on the preferred stock, the company carried \$169,562 to the surplus account, or a gain of \$508,216. In other words, the previous annual report showed a deficit after preferred dividends of \$338,654. The total surplus now stands at \$1,229,512. At the annual meeting a resolution approving all the official acts of the company during the past year was adopted by the shareholders. The retiring directors and officers were re-elected.

Following is the detailed income account for the year ended June 30 last, compared with the previous year:

	1909.	1908
Gross profits.....	\$1,359,191	\$867,293
Deductions:		
Salaries of officers.....	55,708	51,000
Repairs, renewals, &c.....	378,886	307,653
Interest .....	117,189	249,032
Total deductions.....	\$551,783	\$607,685
Net profits.....	\$807,407	\$259,608
Bond interest.....	39,583	.....
Preferred dividends.....	598,262	598,262
Surplus for year.....	\$169,562	\$338,654
Previous surplus.....	1,059,950	1,648,603
Surplus.....	\$1,229,512	\$1,309,949
Less amount to general reserve.....	.....	250,000
Profit and loss surplus, June 30.....	\$1,229,512	\$1,059,949

\* Deficit.

A comparison of the current assets and current liabilities shows the working capital at June 30, 1909, to be \$2,739,390.

Continued improvement in business is noted since July 1, and officials of the company take a hopeful view of the outlook.

**A New Structural Tube Plant.**—The Keystone Tube Company, Pittsburgh, recently organized, has purchased 10 acres of land at Queens Junction, Butler County, Pa., and has commenced excavating for the foundations for a steel tube mill in which special tubing and tubular shapes for bedsteads and other uses will be manufactured. The plant will be located on the Bessemer & Lake Erie and the Western Allegheny railroads, and thus will have excellent shipping facilities, with cheap fuel and a number of other natural advantages. The first building of the plant will be a steel frame structure, 60 x 205 ft., with a lean-to on each side. It will be equipped with specially designed machinery, and will have an initial capacity of 12,000 tons annually. The company owns a gas well in proximity to the plant, with a capacity of 300,000 cu. ft. of gas daily, which carries with it a lease on 75 acres of additional oil and gas territory. I. W. Bollinger is president; F. C. Perrott, vice-president; J. E. McNary, secretary, and Joshua Nuttall, treasurer.



## The Iron and Metal Trades

### Large Sales of Steel Rails for 1910 Delivery.

#### An Advancing Tendency in Finished Iron and Steel.

The event of the week is the opening by the United States Steel Corporation of its books, for 1910 delivery, on steel rails, and the acceptance of orders from a few Western roads aggregating 200,000 tons. The quantity ordered by one of these roads is unusually large, and indicates that the demand upon the mills for next year will be more than normal. To the steel industry at large this points to very favorable conditions for the coming year.

It will strengthen the conviction which has been gaining ground throughout the whole industry that ample, and possibly more than ample employment is coming into sight. In some branches, however, the price movement will bear close watching in view of the possibility of importations under the new tariff rates. Even to-day we are not far away from the chance of profitable importations of pig iron on the Atlantic Coast, and American merchants have already purchased pig iron warrants abroad. The pig iron so purchased may be actually brought over later on, or the warrants sold at a profit should the markets there advance in sympathy with our own, which they so often do. In other words, if they lag behind us in the advance, foreign pig iron will come in.

The finishing mills have been receiving specifications so liberally that they are getting behind in deliveries from one to two months, and that premiums are being asked and obtained over base prices for prompt shipment. The minimum on steel and iron bars has been advanced \$1 per ton by the leading sellers, and an upward tendency is developing in other staple lines. Some of the sheet mills are getting higher prices, and a number of tin plate makers are in the same position. It is understood that the leading interest has decided that it will sell no tin plate for 1910 delivery at less than \$3.55 per box, an advance of 15c. over the present market price, but does not intend to make any advance for this year's delivery.

The markets for raw material have stiffened. The leading interest has purchased coke to the extent of 25,000 tons per month for the balance of this year.

The principal feature in the pig iron markets is the continued activity in basic pig in the East, where a positive scarcity has developed for prompt delivery. The demands for this year even do not seem to be fully covered, and there have been sales aggregating about 30,000 tons, including one lot of 25,000 tons at \$17.30, delivered. For a round lot for the first quarter of 1910 \$17.50 was paid, but the majority of sellers are virtually out of the market.

The market is stronger in foundry iron, largely because buyers expect a larger business in the future and show a desire to cover in advance.

One inquiry for 8500 tons for this year's delivery is at hand from a leading electrical company, which was supposed to have taken care of all requirements to the end of the year.

The placing of larger orders by the railroads with the malleable foundries has led to increased buying of malleable Bessemer. Quite a volume of business has been done in the Chicago District.

The agricultural implement people, too, have unexpectedly taken additional quantities of pig iron for this year.

The placing of contracts for structural material has not been active lately. Among those closed are 7000 tons for the Pullman shops, 4000 tons of bridge work for the Winston-Salem line and 1400 tons of bridges for the Burlington. The Chicago & Northwestern has ordered 4000 tons for delivery this year for track elevation, and the Acheson, Topeka & Santa Fé will need 2000 to 4000 tons for the same purpose.

There has been considerable buying of old material in the Chicago market, while in the East something like a deadlock has developed. The largest block of scrap in the San Francisco market, close to 40,000 tons, is reported to have been sold for delivery to Pueblo, so that it will not come to the Atlantic Coast.

## A Comparison of Prices.

### Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

Aug. 18, Aug. 11, July 21, Aug. 19, 1909. 1909. 1909. 1908.

#### PIG IRON, Per Gross Ton:

Foundry No. 2, standard, Philadelphia .....	\$17.25	\$17.00	\$16.50	\$16.50
Foundry No. 2, Southern, Cincinnati .....	16.25	16.25	15.75	15.25
Foundry No. 2, local, Chicago ..	17.00	17.00	17.00	17.35
Basic, delivered, eastern Pa. ....	17.25	17.00	16.00	15.00
Basic, Valley furnace .....	15.25	15.25	15.00	14.50
Bessemer, Pittsburgh .....	16.90	16.90	16.40	16.30
Gray forge, Pittsburgh .....	15.15	15.15	14.90	14.65
Lake Superior charcoal, Chicago	19.50	19.50	19.50	19.50

#### BILLETS, &c., Per Gross Ton:

Bessemer billets, Pittsburgh ..	24.00	24.00	24.00	25.00
Forging billets, Pittsburgh .....	28.00	28.00	28.00	27.00
Open hearth billets, Philadelphia	27.00	27.00	25.50	26.20
Wire rods, Pittsburgh .....	31.00	31.00	29.00	33.00
Steel rails, heavy, at mill .....	28.00	28.00	28.00	28.00

#### OLD MATERIAL, Per Gross Ton:

Steel rails, melting, Chicago .....	16.00	16.00	14.50	14.25
Steel rails, melting, Philadelphia	17.00	17.00	16.00	14.50
Iron rails, Chicago .....	18.50	18.50	17.00	16.50
Iron rails, Philadelphia .....	19.75	19.75	19.50	20.00
Car wheels, Chicago .....	16.00	16.00	16.00	15.50
Car wheels, Philadelphia .....	16.00	15.50	15.00	15.00
Heavy steel scrap, Pittsburgh ..	16.50	16.00	16.00	15.00
Heavy steel scrap, Chicago .....	15.00	14.75	14.00	13.00
Heavy steel scrap, Philadelphia	17.00	17.00	16.00	14.50

#### FINISHED IRON AND STEEL,

Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia ..	1.45	1.45	1.45	1.40
Common iron bars, Chicago .....	1.40	1.37½	1.35	1.50
Common iron bars, Pittsburgh ..	1.50	1.45	1.45	1.40
Steel bars, tidewater, New York ..	1.51	1.46	1.46	1.56
Steel bars, Pittsburgh .....	1.35	1.30	1.30	1.40
Tank plates, tidewater, New York ..	1.56	1.56	1.51	1.76
Tank plates, Pittsburgh .....	1.40	1.40	1.35	1.60
Beams, tidewater, New York .....	1.56	1.56	1.51	1.76
Beams, Pittsburgh .....	1.40	1.40	1.35	1.60
Angles, tidewater, New York .....	1.56	1.56	1.51	1.76
Angles, Pittsburgh .....	1.40	1.40	1.35	1.60
Skelp, grooved steel, Pittsburgh ..	1.35	1.35	1.35	1.45
Skelp, sheared steel, Pittsburgh ..	1.45	1.45	1.45	1.50

#### SHEETS, NAILS AND WIRE,

Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh ..	2.20	2.20	2.20	2.50
Wire nails, Pittsburgh .....	1.80	1.80	1.70	1.95
Cut nails, Pittsburgh .....	1.75	1.75	1.70	1.75
Barb wire, galv., Pittsburgh .....	2.10	2.10	2.00	2.40

#### METALS, Per Pound:

	Cents.	Cents.	Cents.	Cents.
Lake copper, New York .....	13.62½	13.62½	13.50	13.62½
Electrolytic copper, New York ..	13.25	13.25	13.00	13.50
Spelter, New York .....	5.75	5.75	5.35	4.65
Spelter, St. Louis .....	5.60	5.60	5.27½	4.50
Lead, New York .....	4.37½	4.30	4.35	4.60
Lead, St. Louis .....	4.25	4.15	4.20	4.45
Tin, New York .....	30.02½	29.85	29.00	29.50
Antimony, Hallett, New York .....	8.12	8.12½	7.50	8.00
Nickel, New York .....	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York .....	\$3.64	\$3.64	\$3.64	\$3.89

\* These prices are for largest lots to jobbers.

## Prices of Finished Iron and Steel F.O.B. Pittsburgh.

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural steels and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

**Structural Shapes.**—I-beams and channels, 3 to 15 in., inclusive, 1.40c., net; I-beams over 15 in., 1.50c., net; H-beams over 8 in., 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.45c., net; angles, over 6 in., 1.50c., net; angles, 3 x 3 in. and up, less than ¼ in., 1.60c., base, half extras, steel bar card; tees, 3 in. and up, 1.50c., net; zees, 3 in. and up, 1.45c., net; angles, channels and tees, under 3 in., 1.35c., base, plus 10c., half extras, steel bar card; deck beams and bulb angles, 1.65c., net; hand rail tees, 2.75c., net; checkered and corrugated plates, 2.75c., net.

**Plates.**—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.40c., base. Extras over this price are as follows:

Tank, ship and bridge quality, ¼-in. thick on edges, 100 in. wide, down to but not including 6 in. wide, is taken as base.

Steel plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, shall be considered  $\frac{1}{4}$ -in. plate. Steel plates over 72 in. wide must be ordered  $\frac{1}{4}$ -in. thick on edge, or not less than 11 lb. per square foot, to take base price. Steel plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. shall take the place of 3-16-in.

Percentages as to overweight on plates, whether ordered to gauge or weight, to be governed by the Association of American Steel Manufacturers' Standard Specifications.

Gauges under $\frac{1}{4}$ -in. to and including 3-16-in. plates on thin edges.....	\$0.10
Gauges under 3-16-in. to and including No. 8.....	.15
Gauges under No. 8 to and including No. 9.....	.25
All sketches (excepting straight taper plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.).....	.10
Complete circles.....	.20
Boiler and flange steel plates.....	.10
"A. B. M. A." and ordinary firebox steel plates.....	.20
Still bottom steel.....	.30
Marine steel.....	.40
Locomotive firebox steel.....	.50
Shell grade of steel is abandoned.	
For widths over 100 in. up to 110 in.....	.05
For widths over 110 in. up to 115 in.....	.10
For widths over 115 in. up to 120 in.....	.15
For widths over 120 in. up to 125 in.....	.25
For widths over 125 in. up to 130 in.....	.50
For widths over 130 in.....	1.00

TERMS.—Net cash 30 days. Pacific Coast base, 1.30c. f.o.b. Pittsburgh.

**Sheets.**—Minimum prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows: Blue annealed sheets, No. 10 and heavier, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 2.05c.; box annealed sheets, Nos. 17 to 21, 2c.; Nos. 22 to 24, 2.05c.; Nos. 25 and 26, 2.10c.; No. 27, 2.15c.; No. 28, 2.20c.; No. 29, 2.25c.; No. 30, 2.35c.; Galvanized sheets, Nos. 13 and 14, 2.25c.; Nos. 15 and 16, 2.35c.; Nos. 17 to 21, 2.50c.; Nos. 22 to 24, 2.65c.; Nos. 25 and 26, 2.85c.; No. 27, 3.05c.; No. 28, 3.25c.; No. 29, 3.25c.; No. 30, 3.60c. Painted roofing sheets, No. 28, \$1.55 per square. Galvanized roofing sheets, No. 28, \$2.80 per square for 2 $\frac{1}{2}$ -in. corrugations.

**Wrought Pipe.**—Discounts on steel pipe,  $\frac{3}{4}$  to 6 in., in carloads to the largest trade, are 81 and 5 per cent. off list, and on iron pipe,  $\frac{3}{4}$  to 6 in., are 77 and 5 per cent. off list.

**Boiler Tubes.**—Regular discounts are as follows:

Boiler Tubes.	Steel.
1 to 1 $\frac{1}{2}$ in.....	.50
1 $\frac{1}{2}$ to 2 $\frac{1}{4}$ in.....	.62
2 $\frac{1}{4}$ to 5 in.....	.70
2 $\frac{1}{2}$ in.....	.64
6 to 13 in.....	.62
2 $\frac{1}{2}$ in. and smaller, over 18 ft. long, 10 per cent. net extra.	
2 $\frac{3}{4}$ in. and larger, over 22 ft. long, 10 per cent. net extra.	

**Wire Rods.**—Bessemer, open hearth and chain rods, \$31.

**Steel Rivets.**—Structural rivets, 1.70c., base; boiler rivets, 1.80c., base.

## Chicago.

FISHER BUILDING, August 18, 1909.—(By Telegraph.)

Weather conditions throughout the corn belt have been ideal the past week from the standpoint of the growing crop—very hot with sufficient moisture. The immediate prospect of a record breaking corn crop has brought the railroads into the market with larger and more urgent orders for track supplies and material for car shop work. In the Southwest officials of the leading roads admit the prospect of a car shortage, as the tonnage of crops is large and prices encourage an early movement to market. The long deferred buying movement by the railroads has come at last, and adds considerably to the difficulty of the steel mills, as they are already well booked with specifications for early deliveries. From other sources specifications for bars, plates, structural shapes and other products continue in good volume. The bar iron mills have come in for their share of the volume of new business, and have booked within the last few weeks about all that they can take care of for immediate deliveries. No large orders were closed last week for standard rails, but the aggregate of orders taken by the leading interest here was 16,000 tons, against 8000 tons the week before. The mills have worked out practically all of the low priced orders for bars and structural shapes, which they contracted last spring. Current specifications show a fair profit, and the conservative factors in the trade are bending their energies to the problem of taking care of the demand for immediate or early deliveries so as to avoid any further advance in prices at this time, which it is feared might check the growth of the buying movement. The most important new business of the week was in structural material. The Chicago & Northwestern has ordered 4000 tons additional for track elevation for its new terminals; construction work at Gary calls for 4000 tons in the near future, and the contract for the Pullman shops, for over 7000 tons, which was let to the Kenwood Bridge Company last week, will reach the mills as soon as the details are worked out.

**Pig Iron.**—Sales of malleable Bessemer amounting to about 10,000 tons were made the past week in lots of 500 to 2000 tons. There were also sales of several thousand tons of Lake Superior charcoal iron. These were the only transactions of the week which amounted to any considerable

tonnage. The market is stronger in tone in both Northern and Southern irons, but aside from the items mentioned, the volume of business has been small and scattered in lots of 200 to 500 tons. Practically all of the melters in this district have covered their requirements to the first of the year so far as they can determine from contracts in hand for their products or estimate of their output. As they book more business or revise their estimates, they come into the market for additional lots of 200 to 500 tons; hence the current business in foundry grades is limited to buying of this character. The purchases of malleable Bessemer were brought out by large orders which the railroads have placed recently with the malleable foundries. The general improvement in business is stiffening the prices of Northern iron and making the furnaces conservative in seeking additional orders. The leading sellers of Southern iron are all asking \$13.50, Birmingham, for No. 2 foundry, and some talk of \$14, but while they are all holding firm for \$13.50, some iron can still be had at less figures from furnaces that are apparently not so well sold up for the balance of the year. Some of this, however, is analysis iron or odd lots held at the furnaces. There have been sales the past week at \$13.50 in sufficient aggregate volume to give the leading sellers confidence that they can hold this price. No sales of importance have been made yet for 1910 by either Northern or Southern interests. There have been reports of sales for early 1910 deliveries of Northern iron, but investigation shows that the quantity was very small and was done as an accommodation to old customers. The furnaces and sales interests hold to the view that business conditions have not developed sufficiently to warrant any safe estimate of values beyond the first of the year. The following are prices for August and September delivery, f.o.b. Chicago:

Lake Superior charcoal.....	\$19.50 to \$20.00
Northern coke foundry, No. 1.....	17.50 to 18.00
Northern coke foundry, No. 2.....	17.00 to 17.50
Northern coke foundry, No. 3.....	16.50 to 17.00
Northern Scotch, No. 1.....	18.00 to 18.50
Southern coke, No. 1.....	17.85 to 18.35
Southern coke, No. 2.....	17.35 to 17.85
Southern coke, No. 3.....	16.85 to 17.35
Southern coke, No. 4.....	16.35 to 16.85
Southern coke, No. 1 soft.....	17.85 to 18.35
Southern coke, No. 2 soft.....	17.35 to 17.85
Southern gray forge.....	15.85 to 16.35
Southern mottled.....	15.60 to 16.10
Malleable Bessemer.....	17.00 to 17.50
Standard Bessemer.....	18.40 to 18.90
Jackson Co. and Kentucky silvery, 6 %.....	19.90 to 20.40
Jackson Co. and Kentucky silvery, 8 %.....	20.90 to 21.40
Jackson Co. and Kentucky silvery, 10 %.....	21.90 to 22.40

(By Mail.)

**Billets and Rails.**—Wire rods are now quoted at an advance of \$1 in this market, making the price \$32, Pittsburgh. Inquiries are limited to current requirements, no orders of any magnitude being reported. The movement of forging billets is limited to specifications on contracts, as the mills in this district are not taking any new orders at present.

**Rails and Track Supplies.**—The leading feature of the market this week is heavy miscellaneous buying by railroads. No large orders for rails were booked, but the aggregate of general orders for standard rails received by the Illinois Steel Company was 16,000 tons, against 8000 tons the previous week. The demand for bolts, spikes and tie plates is running steadily ahead of the capacity of the mills, and a general feature of the orders is that the railroads want immediate delivery. They followed the hand to mouth policy so long that their necessities are now urgent, in view of the large crop traffic they will have this fall. The Harriman lines are in the market for 15,000 tons of tie plates as noted last week, but the order has not yet been booked. There is a fair demand for light rails, but the active business is in standard sections and track fastenings. Prices remain unchanged as follows: 40 to 45 lb. sections, \$26; 30 to 35 lb. sections, \$26.75; 16, 20 and 25 lb. sections, \$27; 12-lb. sections, \$28, Chicago, less 50c. a ton on lots of 500 tons and \$1 a ton on lots over 500 tons.

**Structural Material.**—The contract for the new Pullman shops was let last week to the Kenwood Bridge Company. The exact requirements cannot be stated, but they are in excess of 7000 tons of structural material, the uncertainty regarding the quantity being due to the fact that the plans have not been worked out in detail. This order will not reach the steel mills for some little time. The Chicago & Northwestern has ordered from the American Bridge Company 4000 tons additional track elevation in connection with the new passenger terminal of that road in Chicago. The Chicago, Burlington & Quincy has also placed with the same interest an order for 1400 tons of new bridges in addition to a previous contract. The Chicago, Milwaukee & St. Paul has let the contract for the Russell Creek viaduct, 250 tons, to the Toledo-Massillon Bridge Company. Other orders booked last week were 257 tons for a new theatre at St. Louis, 100 tons for the Messer Memorial Library at Provo, Utah, and 100 tons for a new shop of the Rumely Company, Laporte, Ind. Specifications have also been completed for 4000 tons of fabricated material which will be required at the new Gary Works to go into the by-products gas building, skull cracker building and stripper building. There has been



the usual run of small orders, and specifications on contracts with railroads continue at the rate of 4000 to 5000 tons each week. An independent steel company which has been asking 1.63c., Chicago, for some time reports having booked a fair order at this price the past week, but the general market continues at 1.58c., base, Chicago.

**Sheets.**—Orders are accumulating at the mills faster than they can be filled, and the leading independent mill in this district is getting \$2 above the regular market price for blue annealed sheets. The demand for black sheets continues heavy, and buyers are meeting more and more difficulty in getting satisfactory delivery. Prices are maintained with the strength that appears in all lines of steel this week.

**Plates.**—The plate mills are well booked up with specifications from car builders, along with structural and tank work. No important new orders are reported for steel cars, but the orders already received have provided the mills with a large tonnage to work out. A few months ago the great problem of sales departments was to get orders enough to keep the mills going, but now the chief difficulty is to take care of contracts and arrange satisfactory deliveries on new business. Prices remain unchanged, but are very firm at 1.58c., base, Chicago.

**Bars.**—The market seems to grow stronger each week and buyers who have deferred placing their orders find great difficulty in getting shipments for their immediate requirements. A local mill refused 1.55c. on Monday on an order for steel bars for immediate shipment, and prices are appreciably stronger on both steel and iron bars. One satisfactory feature of the situation in the bar mills is that practically all of the low priced business that was taken last spring has been cleared off the books. The only exception to this statement is that the agricultural implement manufacturers have contracts which in some cases run into next year at the low prices. Specifications on more recent contracts continue to come in rapidly. Until recently the bar iron mills had not shared in the general revival in trade, but they are now booked up to full capacity for the immediate future and prices are more satisfactory. The minimum on iron bars is 1.40c. this week, with the business going from that figure to 1.45c. Hard steel bars are 1.40c. to 1.45c., and soft steel 1.48c. to 1.53c.

**Merchant Pipe.**—The demand for merchant pipe is very satisfactory, coming in the ordinary volume and giving the mills a fair tonnage.

**Cast Iron Pipe.**—The season for municipal contracts for pipe is about over, and there have been no important settings the past week. The foundries, however, are well booked with contracts which have been taken during the spring and summer. Miscellaneous business from jobbers shows a little improvement, and on the whole the condition of the trade is very satisfactory. The railroads continue to place good orders for culvert pipe. We quote per net ton, Chicago, as follows: Water pipe, 4-in., \$27.50; 6 to 12 in., \$26.50; 16-in. and up, \$25.50, with \$1 extra for gas pipe.

**Old Material.**—Continued purchases by large consuming interests have caused a further advance in prices of wrought scrap. The Republic Iron & Steel Company has bought a large tonnage, and the Pullman interests are buying actively, as they had but little stock when their mill was reopened. Melting steel is also stronger, and the demand for malleable and cast scrap is more active. Railroad offerings this month have been light, and the supply of scrap in transit is less than a couple of months ago, affording dealers an opportunity to market their yard stocks. The following prices are per gross ton, f.o.b. Chicago:

Old iron rails.....	\$18.50 to \$19.00
Old steel rails, rerolling.....	16.00 to 16.50
Old steel rails, less than 3 ft.....	16.00 to 16.50
Relaying rails, standard sections, subject to inspection.....	22.50 to 23.50
Old car wheels.....	16.00 to 16.50
Heavy melting steel scrap.....	15.00 to 15.50
Frogs, switches and guards, cut apart.....	15.00 to 15.50
Shoveling steel.....	14.00 to 14.50

The following quotations are per net ton:

Iron angles and splice bars.....	\$17.50 to \$18.00
Iron car axles.....	20.00 to 21.50
Steel car axles.....	18.00 to 18.50
No. 1 railroad wrought.....	14.75 to 15.25
No. 2 railroad wrought.....	13.75 to 14.25
Springs, knuckles and couplers.....	14.00 to 14.50
Locomotive tires, smooth.....	15.50 to 16.00
No. 1 dealers' forge.....	12.00 to 12.50
Steel axle turnings.....	10.25 to 10.75
Machine shop turnings.....	9.00 to 9.50
Cast and mixed borings.....	6.00 to 6.50
No. 1 bushing.....	12.00 to 12.50
No. 2 bushing.....	9.00 to 9.50
No. 1 boilers, cut to sheets and rings.....	11.00 to 11.50
No. 1 cast scrap.....	14.00 to 14.50
Stove plate and light cast scrap.....	11.75 to 12.25
Railroad malleable.....	13.75 to 14.25
Agricultural malleable.....	12.00 to 12.50
Pipes and flues.....	11.00 to 11.50

**Boiler Tubes.**—The boiler shops have been booking more business the past month, and this has resulted in a better demand for merchant tubes. The railroads are also buying more freely for repair work, but otherwise the market is quiet.

**Metals.**—Trading has been a little more active, stimulated by the improvement in prices of copper and spelter and a slight advance in lead. The growing activity of metal using industries through the West has brought more consumers in the market, and in some cases they show a disposition to make heavier purchases as a hedge against future possibilities in the market. Quotations are as follows: Casting copper, 13½c.; lake, 13¾c. to 14c., in car lots, for prompt shipment; small lots, ¼c. to ½c. higher; pig tin, car lots, 31c.; small lots, 33c.; lead, desilverized, 4.45c. to 4.55c., for 50-ton lots; corroding, 4.70c. to 4.80c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; spelter, 5.65c. to 5.70c.; Cookson's antimony, 10½c., and other grades, 9¾c. to 10¾c.; sheet zinc is \$7.50, f.o.b. La Salle, in car lots of 600-lb. casks. On old metals we quote: Copper wire, crucible shapes, 13¼c.; copper bottoms, 11½c.; copper clips, 12¼c.; red brass, 11½c.; yellow brass, 9¾c.; light brass, 6¾c.; lead pipe, 4¼c.; zinc, 4.50c.; pewter, No. 1, 23c.; tin foil, 25c.; block tin pipe, 27c.

## Pittsburgh.

PARK BUILDING, August 18, 1909.—(By Telegraph.)

**Pig Iron.**—This branch of trade has been quiet the past week, making rather a sharp contrast with previous activity. The chief new feature is the appearance of considerable inquiry for foundry iron for first quarter and first half delivery, which seems to indicate that consumers are fairly well covered for this year. Furnaces generally quote a substantial advance for next year, but in the past fortnight there have been sellers at a little above the current market, and consumers are unlikely to pay any material advance. We quote the minimum of the market at \$16 for standard Bessemer; \$15.25 for basic and No. 2 foundry; \$15.50 for malleable Bessemer, and \$14.25 for gray forge, all at Valley furnace, for delivery this year, freight to Pittsburgh being 90c. Odd lots frequently command higher prices than these. There is a large tonnage of Bessemer being held for higher prices, while some consumers, who have been tentatively inquiring, will not pay over \$16, and some would expect to shade this price if they bought. We note a sale of 200 tons of Bessemer for fourth quarter at \$16.50, Valley, made through a broker, and a sale of 2500 tons of basic for immediate shipment at \$15.25. Fannie Furnace at West Middlesex will blow in shortly, putting all Shenango Valley merchant furnaces in blast, while McKeefrey Furnace is preparing to go in late in September, which will put all merchant furnaces in the Mahoning Valley in blast, except two, which are undergoing improvements.

**Steel.**—Billets and sheet bars are scarce and firmly held, but the demand is relatively light, consumers being well covered by contracts. We quote the minimum of the market, \$24 on Bessemer billets, \$25 on open hearth, and \$28 on forging billets, with sheet bars \$25.50 for random lengths and \$26 for cut bars, all f.o.b. Pittsburgh, with full freight added. Occasionally slightly higher prices are paid for small lots for immediate shipment. Rods are now \$31, Pittsburgh.

(By Mail.)

A slight improvement from last week is apparent in the general iron and steel situation. Some finished products command somewhat better prices. The minimum on both steel and iron bars is \$1 a ton higher; cut nails have been advanced 5c. a keg, and some independent sheet and tin plate mills have taken independent action and are asking advanced prices in a number of cases, particularly on specialties. It is definitely understood that while the leading interest will not sell tin plate at this time for 1910 delivery, when it comes to do so it will not be at less than \$3.55, an advance of 15c. a box from the present market. Sheets, it is believed, are also in line for a general advance. Specifications for finished products continue to crowd the mills, and rolling schedules are being made up farther and farther in advance. While the United States Steel Corporation made a new record in pig iron production in July, turning out a larger tonnage than in any previous month, it is expected to better this new record very materially in October, on account of more favorable weather conditions and the blowing in of additional furnaces. Steam is up in the Neville Island Furnace, and the first cast will probably be made Tuesday or Wednesday of next week. Edith Furnace will be blown in by September 1. These two furnaces were formerly operated by the American Steel & Wire Company, but are now owned by the Carnegie Steel Company and will be under the general superintendency of James Scott, the company's veteran furnace superintendent. The Columbus blast furnaces and steel works are to be started as soon as the sheet and tin plate subsidiary is through with its labor trouble. The new Duquesne Furnace No. 6 will be ready for operation soon, the other new Duquesne Furnace, No. 5, having been blown in recently. The Carnegie Steel Company is operating practically all its open-hearth steel capacity, and its only Bessemer steel works idle are the Columbus plant and the Bessemer department at Homestead, this latter having been inactive for a long time. Bessemer ingots are being

shipped from Edgar Thomson to Duquesne, as the Edgar Thomson rail mills are not running full.

**Ferromanganese.**—The market is slightly firmer than a week ago, but is not quotably higher. Prompt shipments command \$41, Baltimore, several sales having been made at that figure, while for next year sellers usually ask an advance. The freight to Pittsburgh is \$1.95.

**Ferrosilicon.**—The market is firm, and shows a slight advancing tendency. Fifty per cent. ferrosilicon is quotable at \$63.50 to \$65, Pittsburgh, according to quantity. Blast furnace ferrosilicon shows a stronger tone, but is not quotably higher, the market being \$25 for 10 per cent., \$26 for 11 per cent. and \$27 for 12 per cent., delivered, Pittsburgh.

**Muck Bar.**—The market continues firm, with little material available, and prices quoted at \$28 to \$28.50, Pittsburgh.

**Skelp.**—This product is scarce, and the market is very firm at former prices, as follows: Grooved steel skelp, 1.35c. to 1.40c.; sheared, 1.45c. to 1.50c.; grooved iron, 1.55c. to 1.60c., and sheared iron, 1.60c. to 1.65c., all for ordinary widths and gauges, f.o.b. Pittsburgh.

**Spelter.**—The market is very quiet, compared with the activity of last week, and prices are somewhat irregular, with a slight tendency toward a lower level. We quote prime Western spelter at 5.77½c. to 5.82½c., delivered, Pittsburgh, for carload and larger lots.

**Steel Rails.**—The Edgar Thomson rail mills continue the better gait of operations recently established, No. 3 being on in full, while Nos. 1 and 2 are on day turn, and the rail output is about 60 per cent. of normal. The Edgar Thomson blast furnaces and steel works are running full, surplus ingots being shipped to Homestead, which has not been producing Bessemer steel of late. Splice bars are 1.50c., Pittsburgh. We quote standard rail sections at \$28, at mill, and light rails as follows: 8 to 10 lb., \$34; 12 and 14 lb., \$29; 16, 20 and 25 lb., \$28; 30 and 35 lb., \$27.75, and 40 and 45 lb., \$27, f.o.b. Pittsburgh. One leading maker of light rails, located outside the Pittsburgh District, is quoting about \$1 a ton higher than these prices, but equalizes freights with Pittsburgh.

**Plates.**—The plate market shows a firmer tone, and while 1.40c. can still be done on desirable orders, the price is likely to be withdrawn shortly, as last Friday the Carnegie Steel Company advanced its price on bars to 1.35c., and will probably soon make a similar advance in plates and shapes. The inability of the Pressed Steel Car Company to adjust its labor matters has released a considerable plate tonnage which has been diverted to other consumers who were anxious to get better deliveries, and even with this gain the Carnegie Steel Company is still somewhat behind on plates. The latest steel car orders placed have been the orders of the Baltimore & Ohio, 2600 with the Standard Steel Car Company and 1000 with the Cambria Steel Company. We quote plates at 1.40c. to 1.45c., f.o.b. Pittsburgh, for ¼-in. and heavier, depending on the order.

**Structural Material.**—New contracts in fabricated steel are light, but the structural mills continue decidedly behind in deliveries, and in consequence some of the fabricating shops are not working as full as they would like. While 1.40c. can still be done with one or two of the mills on beams and channels, 15 in. and under, the price is likely to be withdrawn shortly, 1.45c. being regularly done on small orders.

**Bars.**—On Friday, August 13, the Carnegie Steel Company withdrew its price of 1.30c. on steel bars, and has since been quoting a minimum of 1.35c., which is the minimum of the market. Specifications are very good, and all the mills are behind in deliveries, production being probably the largest on record. Iron bars have advanced \$1 a ton to a minimum of 1.50c., Pittsburgh, a price which has been quoted for some time by the Republic Iron & Steel Company at its Youngstown mills.

**Tin Plate.**—The American Sheet & Tin Plate Company reports that it is conducting operations at 137 of its tin mills this week. Its operations have just commenced to compare favorably with those of a year ago, since at that time mills were being laid off on account of the active season closing. In the week of last year corresponding to the present week the company operated only about 126 tin mills, whereas in the first fortnight of July, 1908, it operated 213 mills, and in the first fortnight of last month it operated only about 100. The company has definitely decided that it will sell no tin plate for next year's delivery at less than \$3.55, an advance of 15c. over the present market, but does not intend to make any advance for this year's delivery. It is decidedly behind in deliveries, the requirements of the canning trade showing a greater excess over production realized since July 1 than was expected. A number of the independent tin plate manufacturers have advanced prices on their own account, although the advance can hardly be considered general. One independent interest has advanced its prices on bright and roofing plates 25c. a box to the entire trade, while most of the others have made advances of 15c. to 25c. to buyers who are not their regular customers, but

who are endeavoring to secure additional material, at the same time taking care of their regular trade at \$3.40, which is still quotable as the market, except in special circumstances. The independent mills are running full and expect to continue so for some months. The outlook for strong prices is very good for the winter and spring, but within a twelvemonth, on account of the advent of new capacity, a degree of competition is expected, to which the tin plate trade has been a stranger for a long time.

**Sheets.**—The market is very firm, the demand having quietly increased until nearly all the mills find themselves well sold up and unable to make as prompt deliveries as customers would like. Here and there prices have been advanced, particularly on specialties, but no general advance is expected in the near future. Before the end of the year, however, an advance of \$2 a ton is probable. Prices are very firm at 2.20c. for black and 3.25c. for galvanized, and \$1.55 per square for painted corrugated and \$2.80 for galvanized corrugated. Some mills are refusing to book orders for these products after October 31, expecting a general advance. The American Sheet & Tin Plate Company reports operating 141 sheet mills this week, its total number being 186.

**Hoops and Bands.**—The demand for hoops and bands is fairly good, but is not as heavy relatively as is the demand for steel bars. We quote hoops at 1.50c. and bands at 1.30c.

**Shafting.**—Prices are better maintained than formerly, while the demand is quite satisfactory. Regular discounts remain at 60 per cent. off in carloads and 55 per cent. off in less than carloads, delivered, in base territory.

**Spikes.**—Specifications and new orders are fairly active, and the volume of business of the second half of the year promises to be much larger than that of the first half. Prices are very firm at \$1.65 for railroad spikes, 4½ x 9-16 in. and larger, and for smaller sizes and boat spikes, \$1.70, base, subject to standard card extras, with an advance of 5 per cent. in less than carload lots.

**Merchant Pipe.**—The demand continues good for merchant pipe, the mills being booked up solidly for about 60 days, and some being practically out of the market. No large orders for line pipe are reported as under negotiation, but the mills are well sold up for the balance of the year on this material. The official discounts on black steel pipe ¼ to 6 in. are 81 and 5 and on iron pipe ¼ to 6 in. 77 and 5 in carload and larger lots to the largest trade.

**Boiler Tubes.**—The demand for boiler tubes has been showing a steady improvement, and prices are trending toward greater firmness.

**Rivets.**—The demand has improved for rivets, and the market is firm. We quote 1.70c., base, for round head structural rivets, ½ in. and larger, and 1.80c., base, for cone headed boiler rivets, ½ in. and larger, f.o.b. Pittsburgh, in carload and larger lots.

**Coke.**—The coke trade regards it as settled that there will be no merger of coke producing companies, such as was contemplated and worked upon very assiduously, but that there will probably be a consolidation of the Thompson interests. Prices have somewhat stiffened. There is some buying of prompt coke, but little interest in contracts. McKeefrey Furnace at Leetonia, Ohio, will probably blow in the latter part of September, and coke may be bought in the open market, as this interest's coke production for the year has been sold. We quote standard Connellsville furnace coke at \$1.65 to \$1.75 per net ton at oven for prompt shipment, and \$1.75 to \$1.85 for contract over the balance of the year, and 72-hr. foundry coke at \$2 to \$2.25 for either prompt or contract. Coke operations are somewhat hampered by the shortage of men. More than once since the slump in production late in 1907 men have been drawn to the coke regions on false alarms, and now when the demand for labor is heavy they are somewhat chary about making fresh trips. The week's production is reported at 395,000 net tons, a gain of 10,000 tons from the previous week.

**Iron and Steel Scrap.**—The market shows a still firmer tone, many producers and dealers holding their material for prices considerably above the present level. A large amount is thus held back, but it is believed the market can easily absorb it. Many holders of heavy melting steel are waiting for a price of \$18, but occasional lots have been picked up in the week at \$16.50 and \$17, depending on point of delivery. Cast borings have advanced slightly after having been held steady for several weeks by an important consumer staying out of the market pending completion of deliveries on a large purchase it had made from a dealer. There is a good demand for low phosphorus scrap, which commands slightly higher prices. The market is quotable as follows per gross ton: Heavy steel scrap for Monessen, Sharon, Follansbee, Leechburg, Steubenville and in the Pittsburgh District, \$16.50 to \$17; cast iron borings, \$10 to \$10.50; bundled sheet scrap, \$15 to \$15.25, delivered at consuming point; No. 1 cast scrap, \$15.50 to \$15.75; No. 2, \$14.50 to \$14.75; No. 1 railroad malleable scrap, \$15.50 to \$16; grate bars, \$12.50 to \$12.75; No. 1 busheling scrap, \$15. to \$15.50; No. 2, \$11.25 to \$11.50; low phosphorus melting stock, 0.04



and under, \$20 to \$20.50; locomotive tires, \$18; locomotive axles, \$26 to \$26.50; machine shop turnings, \$12 to \$12.50; rerolling rails, delivered at Huntingdon, W. Va., \$17.50; old car wheels, \$16.25 to \$16.50; iron axles, \$24.50 to \$25; stove plate, \$12 to \$12.50; steel axles, \$20 to \$20.50; sheet bar crop ends, \$16.50. All above prices are f.o.b. cars, Pittsburgh, unless otherwise stated.

Reed F. Blair & Co., Frick Building, Pittsburgh, have been appointed sales agents in the Pittsburgh District of Crocker Brothers, New York, manufacturers of pig iron and importers of ferroalloys. The new sales agents succeed Robert A. Bruce, formerly of Pittsburgh.

## Birmingham.

BIRMINGHAM, ALA., August 16, 1909.

**Pig Iron.**—Recent developments in some quarters of the trade are indicative of a disposition to meet the views of sellers, but a conservative course is apparently being pursued both as to prompt shipments and last quarter deliveries. The engagements at the \$13.50, Birmingham, schedule, while consisting largely of comparatively small lots, aggregate an attractive tonnage. A leading interest reports the sale of some 3000 tons within the past week at the price asked; another reports some 1500 tons sold, and still another reports sales so far this month equal to the output, with a basis of \$13.50, Birmingham, the lowest price considered in any case. It is understood that for high grades certain brands are available to preferred customers at a slight concession from the established quotation, but no specific information in this connection can be had and it has been conceded that order books of majority of producers will admit of but few additional commitments for delivery within the present year. There is so far no indication of a recession by the producing interests from their former position as to 1910 commitments. A recent inquiry for quotations on some 15,000 tons for shipment over the first half is known to have failed to elicit other than nominal figures, and *bona-fide* offers for smaller quantities to be taken during the first quarter have been refused. The tonnage held by merchants does not figure materially in the summary of conditions. The aggregate of such holding has been decreased and sales are being made from time to time, yet all negotiations have been along lines not dissimilar to those pursued by the furnace companies and the market has not been affected. Incident to present market conditions, it is noted that the output of a small furnace heretofore operated only under most favorable conditions is being readily disposed of without the necessity of departing from the established market price.

**Cast Iron Pipe.**—This market is reported in a healthy condition, although the major portion of business recently transacted has gone to manufacturers of smaller sizes. The capacity required for the production of tonnage on order books is about normal and the outlook is sufficiently encouraging to warrant preparations for additional capacity. Prospects for the immediate future are largely maintenance requirements, although plans for extensions are being considered by a number of Southern cities. The recent advance in cast iron soil pipe quotations is not yet realized, but producers are no more solicitous of orders. An additional plant will probably be operated on this product at a not far distant date which will be practically equal to the capacity now idle. We quote soil pipe prices as unchanged and water pipe as follows, per net ton, f.o.b. cars here: 4 to 6 in., \$26; 8 to 12 in., \$25; over 12 in., average \$24, with \$1 per ton extra for gas pipe. These quotations are nominal and would probably be shaded on large municipal contracts.

**Old Material.**—Dealers are increasing their stocks wherever practicable and are not disposed to effect sales at the expense of quotations. Contracts have been made by founders within the past week for light cast and stove plate that extend over the last quarter, and the supply of that grade for spot delivery is practically exhausted. We quote dealers' asking prices as follows, which are firm, per gross ton, f.o.b. cars here:

Old iron rails.....	\$15.00 to \$15.50
Old iron axles.....	15.50 to 16.00
Old steel axles.....	12.50 to 13.00
No. 1 railroad wrought.....	13.00 to 13.50
No. 2 railroad wrought.....	11.00 to 11.50
No. 1 country wrought.....	10.00 to 10.50
No. 2 country wrought.....	9.50 to 10.00
No. 1 machinery.....	11.50 to 12.00
Tram car wheels.....	11.00 to 11.50
Standard car wheels.....	12.50 to 13.00
Light cast and stove plate.....	10.50 to 11.00
No. 1 steel.....	11.00 to 11.50
Cast borings.....	5.50 to 6.00

As a preliminary to the future development of an extensive water power on Carp River, the Cleveland-Cliffs Iron Company, Ishpeming, Mich., is installing a 3000-kw. capacity steam driven generator plant, to develop electric current for the operation of its various mines in that district.

## San Francisco.

SAN FRANCISCO, August 11, 1909.

While some descriptions of finished products still fail to show an advance commensurate with the rising values in the East, the Pacific Coast market has a considerably stronger tone in all departments. The competition among local interests continues to be strongly felt, but the large tonnage booked in the last few weeks has brought greater firmness. The Eastern interests are showing some reluctance to take further business in this territory at the prices that have prevailed of late, while demands continue about as large as last month. Owing to the increasing difficulty in getting immediate shipments, orders for forward shipment are coming out in better volume from all quarters. The merchant pipe tonnage shows a further increase, and some large orders are still in prospect. Large inquiries are also coming up for bars. A fair tonnage of both plain and twisted bars has been taken in the last week, and further transactions will probably be closed in the near future. The shipbuilding plants are ordering more plates than for some time past, owing to the increase of marine work on hand. The mining interests are now coming into the market for machinery, light rails, &c., and business from that source is expected to be much larger than last year. The depression in the Nevada mining districts is about over, and with fresh capital large additions are being made to some of the ore mills.

**Rails.**—Bookings of standard sections remain comparatively small, though the total movement is holding up to the recent average, and several orders of some importance may be placed at any time. Light rails are still in demand for both logging and mining development, several logging projects requiring a considerable tonnage. The requirements are fully as large as last month and no decrease in the movement is to be expected during the early fall. It is reported that rails and rolling stock for the 126-mile line of the Sierra-Sacramento Railway will be ordered shortly, but it appears unlikely that any large proportion of the material will be ordered this fall.

**Structural Material.**—The July tonnage of fabricated material for this city was somewhat smaller than had been counted on, though contracts for the entire coast were of fair volume and included a number of large jobs. The San Francisco building permits show a material decrease from the June record and compare very unfavorably with July of last year. The situation, however, is by no means discouraging, as a number of new prospects have come up in the last two weeks, and with the buildings formerly projected there is work in sight to keep the local shops busy for many months. The larger building projects are still being held back and several are unlikely to be placed before next spring, but other contracts may be awarded at any time. With a prospect of delayed deliveries, the local fabricators are placing liberal orders for forward shipment and the tonnage booked by rolling interests is larger than for several months. Eastern fabricators are withdrawing from this market almost entirely, on account of full shops and advancing prices, and are taking no new work except under unusually favorable conditions. The largest of the local shops are also holding off from a large part of the work offered, and most of them have considerable small work on hand. Prices on fabricated work are hardly on a parity with those in the East, but the advance has more than kept pace with that on raw material and the outlook is for increasing firmness, as the competition is less acute. The Central Iron Works has taken a contract for the Starr estate building. The two hospitals in prospect have not yet been let, and the Jean Parker Grammar School, requiring 400 tons, has just come up. There is also an inquiry for a small tonnage for San Quentin prison. About 350 tons will soon be required for the Saunders Building and about 200 tons for the Kittredge Building. A number of steel bridges are to be built this fall in various parts of the State, but so far nothing is known of the details. Contracts have been let for a large building in Los Angeles. The California Metal Trades Association has applied to R. H. Countiss of the Transcontinental Freight Bureau for a change in the tariff on fabricated and unfabricated structural material. The association claims it is entitled to a differential of \$4.50 per ton on the raw material, owing to loss of scrap, &c.

**Pig Iron.**—Conditions in this market are more or less unsettled at present. Imported pig iron has been used almost exclusively by the Pacific Coast foundries for the last year, and with a reduction of the tariff some readjustment of prices will be necessary. The market has been demoralized for about a year and there are at present large quantities held by the importers in bond, in addition to considerable stock in the hands of the larger melters. While the present supply is largely in excess of immediate requirements, prices have for some time been about as low as possible. So far quotations are maintained at the former figures, about \$22.50 being asked by holders of No. 1 English or Chinese iron, but the outlook is uncertain. Purchases have been very small of late, but a slight increase in the demand for foundry work, with prospects of larger requirements in the next few months,

has given a somewhat firmer tone to the market. Buyers are now holding off almost entirely in the anticipation of a reduction.

**Cast Iron Pipe.**—No important contracts have been reported recently, and aside from a few moderate purchases by public service companies little new tonnage has been booked. The municipal pipe testing plant is now at work on the material delivered for the San Francisco system. A number of inquiries are coming in from the smaller municipalities of the coast, but orders are being held back pending the completion of financial arrangements. The city of San Luis Obispo, Cal., is in the market for 10,000 ft. of 8-in. and 1000 ft. of 10-in. pipe, but aside from this there is little business immediately in sight.

**Merchant Pipe.**—Local merchants are still offering pipe in small lots at very low prices, but in view of a prospective advance in mill quotations and decreasing supplies on hand there is a rather stronger feeling in the market. The anticipation of an advance is bringing out considerable buying in all quarters, and the tonnage moving both from local warehouses and from the mills shows some increase. Local jobbers are placing orders more freely than in the past, while a number of new inquiries of moderate importance are coming from the oil fields. Development in this quarter is being conducted on a larger scale, and while the requirements of most of the large projects have been filled, the ordinary movement is expected to show a further increase during the fall.

**Old Material.**—Conditions show little change, either on steel or cast iron scrap. The latter, however, remains quite firm, with increasing requirements in prospect, and the movement is fairly active, with a particular demand for heavy material. The latter is still offered at \$18 per ton, light scrap bringing \$16 to \$17, according to quality.

The Iron & Steel Contracting Company has been incorporated in San Francisco, with a capital stock of \$10,000, by H. E. Fishbeck, J. T. Shaler and W. S. Rea.

Plans have been completed for a number of reinforced concrete buildings for the Benicia Iron Works at Benicia, Cal., in which the entire plant is to be housed. The plans include an office building, blacksmith, foundry, machine and bolt shops.

The Harbor Commissioners recently placed a number of contracts for iron and steel work, structural and reinforcing material, &c., for the San Francisco waterfront.

The California Valve & Airbrake Company, with offices in the First National Bank Building, San Francisco, will hold a special meeting of stockholders September 28, to consider an increase of the capital stock from \$500,000 to \$600,000.

It is reported that the Risdon Iron Works has purchased a large factory site near Martinez, Cal.

The Western Steel Works, recently organized here by A. Haas, D. O. Reinhold and T. H. Downie, has opened an office at 313 Howard street. The company will engage in the manufacture of steel castings and is now installing furnaces.

James A. Moore has placed an order with the Moran Company of Seattle, Wash., for six 500-hp. boilers for the Irondale steel plant.

The Union Iron Works has a contract for a 240-ft. steamer for the Monticello Steamship Company, to cost about \$300,000.

The Oregon City Foundry, Oregon City, Ore., was destroyed by fire August 5, patterns valued at \$12,000 being burned. The Oregon City Iron Works also suffered some damage.

The Joshua Hendy Iron Works, San Francisco, is furnishing a large lot of mining machinery for the Mayflower Consolidated Mining Company, Rhyolite, Nev.

## Philadelphia.

PHILADELPHIA, PA., August 17, 1909.

There seems to be no abatement in the demand for practically all classes of crude and finished materials. In the pig iron market transactions in basic iron continue the leading feature, while the demand for the foundry grades has been somewhat lighter. Finished materials continue active. Steel mills in this territory are practically all operating at full capacity and have their output for the near future pretty well sold. No disposition is shown in any direction by producers to enter contracts for extended forward delivery. The railroads continue to place business more freely and the trade is very much encouraged with the outlook for business during the coming fall. The scarcity of both crude and finished materials for prompt shipment is becoming more acute and prices for spot deliveries continue to advance. Conservative sellers appreciate the danger of running prices up to too high a level, which they believe would result in a reaction which might have an unfavorable influence on trade.

**Pig Iron.**—The demand for steel making grades continues to be the feature of the market. There is a growing scarcity of prompt basic; consumers in nearly every

case find it difficult to get iron already contracted for delivered as promptly as desired, forcing melters into the market for prompt iron. Very little tonnage is available, although additional capacity which will be blown in in the very near future should relieve the situation to some extent. The leading transaction in basic iron was a sale of 25,000 tons for shipment over four or five months, beginning in September, at \$17.30, delivered; a sale of 2000 tons for prompt delivery at a confidential price is also reported, while a lot of 5000 tons for first quarter of 1910 shipment was closed at \$17.50, delivered. A number of sellers are out of the market as far as any basic for this year's shipment is concerned, and while in some instances quotations for first quarter and half of next year will not be named, several producers quote \$18 for that delivery. There has been an increased demand for low phosphorus iron, and prices show an upward tendency; a sale of 2000 tons for shipment during the balance of the year at \$20.50, delivered, is reported, while several smaller sales have been made at about the same price. A little less activity is noted in the demand for the foundry grades. The larger consumers have covered for their requirements in the next few months, some for the balance of the year, and are hardly prepared to come into the market for early 1910 requirements, although there has been some inquiry, largely for the purpose of testing the market. The bulk of the business recently has come from the smaller buyers, taking carloads up to a few hundred tons for prompt and near future delivery, prices for which show considerable variation, dependent on the condition of sellers' order books. Prompt No. 2 X foundry of the standard grades at \$17, delivered, has practically disappeared from the market, the bulk of the business for prompt shipment being done at prices ranging from \$17.25 to \$17.50, delivered, while a few sellers obtain even higher prices for small lots of prompt iron. For fourth quarter shipment sales of No. 2 X foundry in small lots are reported at \$17.75, delivered. There is still a considerable demand for low grade iron, but sellers have advanced asking prices in the majority of cases, at which buyers are not yet inclined to place business. Virginia foundry irons have been taken in small lots for prompt delivery at somewhat higher prices. Several producers are still practically out of the market and buyers find it difficult to place orders for forward delivery, except at materially higher prices, \$18 being named in instances for fourth quarter shipment. Forge iron has not been particularly active, small sales only at unchanged prices being reported. Quotations on nearly all grades show an advance varying according to individual circumstances. For prompt delivery the following quotations about represent the range for standard brands, delivered in buyers' yards, eastern Pennsylvania and nearby points, with fourth quarter delivery in the majority of cases commanding an advance:

Eastern Pennsylvania, No. 2 X foundry	\$17.25 to \$17.50
Eastern Pennsylvania, No. 2 plain	16.75 to 17.00
Virginia, No. 2 X foundry	17.25 to 17.50
Virginia, No. 2 plain	16.75 to 17.00
Gray forge	16.00 to 16.25
Basic	17.25 to 17.50
Low phosphorus	20.50 to 21.00

**Ferromanganese.**—A considerable variation is observed in quotations for both the balance of this year and the first half of 1910. Some little business has been transacted at prices which are considered extremely low—namely, \$41, f.o.b. Baltimore, for first quarter of next year, and \$42, f.o.b. Baltimore, for the balance of this year, while other sellers are holding firmly at \$43, Baltimore, for the balance of this year. The reduction in the duty has apparently had little influence on the price, while the possibility of an increased demand has made importers stiffen up considerably.

**Billets.**—The demand continues active. The bulk of the business is of a prompt nature, for which quite a good aggregate tonnage has been taken. More inquiry for billets for future delivery is being received, but as makers will not book such orders, except at an advance of about \$2 a ton for deliveries extending up to the end of the year, no business has been done. For reasonably prompt shipment ordinary rolling steel commands \$27, delivered, in this territory. Forging steel for prompt shipment takes the usual advance of \$2 a ton, the customary extras applying.

**Plates.**—A good volume of business continues to come out, although there have been fewer heavy individual orders placed. The aggregate total is large and fully covers the output of the mills. Melting capacity at the leading mills continues to increase, and finishing departments are generally running at full capacity. Prices show an upward tendency. While a number of mills quote 1.55c. minimum for prompt carload lots, others refuse to take orders, except the specification be particularly desirable, at less than 1.60c. minimum for carload lots delivered in this territory.

**Structural Material.**—The greater proportion of the business placed recently with Eastern mills and fabricators has been of a small character. One of the mills booked an order for 900 tons of plain material for a building; some smaller lots for bridge and building work have also been taken and the aggregate volume continues large. Mills are



fully engaged and prices are firm for plain material at 1.55c. to 1.65c., delivered, dependent on specification and tonnage.

**Sheets.**—Quite a lively demand is reported for sheets. While the business taken has been largely for prompt shipment, considerable demand for future delivery has developed. As makers ask an advance of about \$2 a ton for extended delivery, very little business of that character has been done. Mills are fully engaged and prices for prompt delivery in this territory range as follows: Nos. 18 to 20, 2.40c.; Nos. 22 to 24, 2.50c.; Nos. 25 and 26, 2.60c.; No. 27, 2.70c.; No. 28, 2.80c.

**Bars.**—The market continues to show more activity and buyers would place considerable tonnage for extended shipment could they get mills to accept such business. Mills as a rule accept orders for fairly prompt delivery only and prices are a trifle higher, ranging close to 1.40c., mill, for refined iron bars, equal to about 1.47c. to 1.52c. delivered. Steel bars continue active at 1.45c. to 1.50c., delivered, with mills refusing business for delivery extending beyond the end of the year.

**Coke.**—The demand has been rather quiet. Foundry coke has been sold in small lots for shipment during the next few months. Furnace coke shows no particular activity. Prices are firm but unchanged, although some makers believe the prospect for higher figures is good. For delivery in buyers' yards in this territory the following range of prices is quoted:

Connellsville furnace coke.....	\$3.90 to \$4.10
Foundry coke.....	4.35 to 4.50
Mountain furnace coke.....	3.50 to 3.70
Foundry coke.....	3.80 to 4.10

**Old Material.**—The leading steel mills claim to be getting scrap freely under the new buying system, although transactions are carefully covered. Heavy melting steel is still nominally quoted by the mills at \$17, delivered, although no individual transactions are reported. Foreign heavy melting steel has been offered at \$16.85, ex ship, Philadelphia, but we can learn of no sales. Several grades of scrap used by steelmakers, other than heavy melting stock, show a sharp advance, while rolling mill grades are nearly all higher on moderate sales. For reasonably prompt delivery in buyers' yards, eastern Pennsylvania and nearby points, the following range of prices is nominally quoted:

No. 1 steel scrap and crops.....	\$17.00 to \$17.50
Low phosphorus.....	20.00 to 21.00
Old steel axles.....	22.00 to 23.00
Old iron axles.....	24.00 to 25.00
Old iron rails.....	19.75 to 20.50
Old car wheels.....	16.00 to 16.50
Choice No. 1 L. R. wrought.....	19.50 to 20.00
Machinery cast.....	15.50 to 16.00
Railroad malleable.....	15.50 to 16.00
Wrought iron pipe.....	16.75 to 17.25
No. 1 forge fire scrap.....	15.00 to 15.50
No. 2 light iron.....	10.00 to 10.50
Wrought turnings.....	13.50 to 14.00
Stove plate.....	13.00 to 13.50
Cast borings.....	11.75 to 12.25
Grate bars.....	14.00 to 14.50

George C. Fogwell succeeds the late F. M. Campbell as district sales agent in charge of the Philadelphia office of the Jones & Laughlin Steel Company. Mr. Fogwell has been assistant to Mr. Campbell in that office since 1903.

## St. Louis.

ST. LOUIS, August 16, 1909.

While the hot wave which is visiting this section slightly checks operations in some lines, the general tone is strong and the demand for all staples seasonable. Bank clearings for the week are \$60,460,000, over 7 per cent. increase. Large contracts have been placed for street work, totaling over \$300,000. The Missouri, Kansas & Texas Railway has recently acquired property in land holdings aggregating about \$2,000,000, which will be improved with freight and passenger depots. The new Missouri Pacific paid this week to the State of Missouri a corporation tax of \$120,000. The consolidation of this system is regarded as advantageous to St. Louis business interests.

**Coke.**—Beyond a stronger tone and some increased interest as indicated by further inquiry there is not much of importance to report concerning the coke market. With the exception of a sale reported by one of the leading offices of 1000 tons for delivery over the first half of 1910, all other sales are small lots, principally for prompt shipment. The lack of more volume of business is in part accounted for by covering for wants earlier in the season. A special grade lot of about 30 cars was sold by one house for immediate shipment. Specifications on contract are coming in freely and satisfactorily. We quote the market unchanged as follows: 72-hr. standard Connellsville for prompt shipment or delivery over the balance of the year, \$2.25; for shipment over one year, \$2.35; for first half 1910, \$2.50, all at oven.

**Pig Iron.**—As forecasted in the reports of this and other markets, the views of furnacemen have become stronger, and especially is this the case at the South; in fact, instructions have been received at some offices not to offer iron, but to

sell subject to confirmation. In one instance a leading Southern furnace has advanced the price to \$14, but this is regarded merely as a notice that no new business is solicited at present. Inquiry has been received by a branch house for a price on 10,000 tons of Southern foundry grades for shipment over the entire year 1910, the deliveries of this iron to be made in Southern territory. There continues to be a very satisfactory inquiry, with some sales of small lots for prompt or balance of the year shipment into St. Louis territory. The De Camp-Yule Iron, Coal & Coke Company reports the sale of a round lot of Missouri basic to a melter in St. Louis territory. Orders on contract iron are coming as specified, and in some instances telegrams are sent asking earlier shipment. It is claimed that no quotations are being made below \$13.50 on Southern No. 2 foundry for any shipment. A feature of present conditions is the withdrawal of price inducement for early shipment. Noting the fact that none of the offices is authorized to offer iron firm for shipment into 1910, we quote No. 2 Southern foundry at \$13.50, Birmingham, for shipment over the balance of the year. If resale iron is being offered, it is held at current prices so far as this market is concerned.

**Finished Iron and Steel.**—The leading interest reports a good inquiry from fabricators for structural material, also a satisfactory demand for standard rails and a fair demand for light rails. Business in bar iron and steel and track material of all kinds has become so large that in some lines orders are booked subject to two months' delay in filling them.

**Lead, Spelter, &c.**—Lead is higher, but the demand is slow. We quote 4.30c., East St. Louis. Spelter is steady at 5.65c. to 5.67½c. and active; in view of the fact that it is not on a parity with ore, an advancing tendency is noted. Zinc ore is excited at Joplin and reported to have sold at \$49.50 per ton, base. Tin is up ¼c.; antimony, ¼c. higher; copper has advanced ¼c. The demand for finished metals is excellent.

**Old Material.**—Increasing demand, a broadening of its scope, since it is coming from all classes of consumers, together with the strength manifested in the pig iron market, have brought about a general advance of 50c. per ton, which practically includes the entire list. Dealers' views are very firm and confident. There are no railroad lists posted. We quote dealers' prices, per gross ton, f.o.b. St. Louis, as follows:

Old iron rails.....	\$16.00 to \$16.50
Old steel rails, rerolling.....	15.50 to 16.00
Old steel rails, less than 3 ft.....	15.00 to 15.50
Relaying rails, standard sections, subject to inspection.....	24.50 to 25.00
Old car wheels.....	17.00 to 17.50
Heavy melting steel scrap.....	15.00 to 15.50
Frogs, switches and guards, cut apart.....	15.00 to 15.50

The following quotations are per net ton:

Iron fish plates.....	\$13.75 to \$14.25
Iron car axles.....	19.50 to 20.00
No. 1 railroad wrought.....	14.50 to 15.00
No. 2 railroad wrought.....	13.50 to 14.00
Railway springs.....	13.50 to 14.00
Locomotive tires, smooth.....	14.00 to 14.50
No. 1 dealers' forge.....	10.50 to 11.00
Mixed borings.....	7.00 to 7.50
No. 1 boilers, cut to sheets and rings.....	10.00 to 10.50
No. 1 cast scrap.....	13.50 to 14.00
Stove plate and light cast scrap.....	10.00 to 10.50
Railroad malleable.....	13.00 to 13.50
Agricultural malleable.....	12.00 to 12.50
Pipes and flues.....	10.50 to 11.00
Railroad sheet scrap.....	9.00 to 9.50
Railroad grate bars.....	10.50 to 11.00
Machine shop turnings.....	8.50 to 9.00

The C. L. Gray Construction Company, East St. Louis, made the lowest bid for the construction of the new Municipal Courts Building. Its bid was \$596,500 for blue Bedford stone and \$716,892 for Kettle River stone. The erection of the building is to be begun at once.

Several large contracts have recently been closed for fluorspar in this market.

The McKinley system will build a large power house at Venice, Ill., near the east approach of the bridge. The plant will cost about \$500,000. Power will be generated here to handle cars from St. Louis to Edwardsville. Its capacity will be 10,000 hp.

## Buffalo.

BUFFALO, N. Y., August 17, 1909.

**Pig Iron.**—While there has not been a great deal of activity in buying the past week, a condition to be expected at this season of the year, especially in view of the stiff advance in prices, the buoyant tone of strength and lively interest in the market assure larger dealings a little later. Considerable inquiry is reported for first half 1910 deliveries, in the nature of feeling of the market by consumers, who have contracts to cover and are inclined to be forehanded. Furnacemen are not quoting, however, except at much higher prices than for current business. Shipments on contracts are heavy and there are increasing evidences of larger consumption in the near future. All of the Lackawanna

Steel Company's seven furnaces are now in blast, furnace No. 3 having been blown in this week, after relining. Prices for prompt and fourth quarter deliveries are very firm, as follows, f.o.b. Buffalo:

No. 1 X foundry.....	\$16.00 to \$16.50
No. 2 X foundry.....	15.75 to 16.25
No. 2 plain.....	15.25 to 15.75
No. 3 foundry.....	15.00 to 15.25
Gray forge.....	14.75 to 15.00
Malleable Bessemer.....	15.50 to 16.00
Basic.....	16.25 to 16.75
Charcoal.....	19.50 to 20.00

**Finished Iron and Steel.**—The leading interest has advanced the price of steel bars to 1.35c., base, Pittsburgh, and reports that stock shipments from the Illinois Steel Company have been advanced \$1 per ton for bars, plates and structural shapes. The statement is made also that orders at these prices are declined for deliveries after November 1, and no quotations are made for 1910 deliveries. Shipments from mills are becoming more and more extended, deliveries not now being promised under six to eight weeks, and jobbers are reaping a benefit in consequence. The demand for structural material continues active, at improved prices. Bids will be received this week for structural material for the James N. Byers commercial building, Buffalo, about 450 tons; for the Spencer Kellogg Company, linseed oil refinery, Buffalo, 100 tons, and for the factory addition and new laboratory building to be erected by the Niagara Electro-Chemical Company at Niagara Falls, about 400 tons. The Buffalo Structural Steel Company has been awarded contract for fabricating and erecting steel for the American Laundry Machinery Company's factory building at Rochester, 400 tons. The American Bridge Company was low bidder for the work, but could not promise delivery by the time required.

**Old Material.**—The market shows continued strength in all lines, and an optimistic feeling is observed among dealers as regards the immediate future, although there is very little increase in buying by consumers or change in conditions or prices since last week's report. Deliveries on contracts are heavy, and the limited tonnages offered by the railroads are readily taken by both consumers and dealers at prices which are practically the same as have been prevailing the past two or three weeks. We quote dealers' prices, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel scrap.....	\$15.00 to \$15.50
Low phosphorus steel scrap.....	19.00 to 19.50
No. 1 railroad wrought.....	16.00 to 16.25
No. 1 railroad and machinery cast scrap.....	14.75 to 15.00
Old steel axles.....	19.00 to 19.50
Old iron axles.....	21.75 to 22.25
Old car wheels.....	15.00 to 15.50
Railroad malleable.....	14.75 to 15.25
Boiler plate.....	13.00 to 13.50
Locomotive grate bars.....	12.00 to 12.50
Pipe.....	12.25 to 12.75
Wrought iron and soft steel turnings.....	9.00 to 9.50
Clean cast iron borings.....	7.50 to 8.00
No. 1 busheling scrap.....	13.00 to 13.50

## Cleveland.

CLEVELAND, OHIO, August 17, 1909.

**Iron Ore.**—The market continues fairly active, but sales during the week have been of rather small lots. Several inquiries are pending for lots up to 25,000 tons, and when contracts for these are closed ore firms do not look for much more buying in round lots. Sales agencies report that they are well sold up on all their better grades of ores, both Bessemer and non-Bessemer. The movement this month continues very heavy. Railroads are being taxed to their utmost capacity, and in some cases there is delay in shipments from the mines to the upper lake docks because the supply of cars is inadequate. For a second time in less than a month severe floods visited the Mesaba ranges last week, and mining operations had to be suspended in some of the open pit properties. As a result of the suspension of work, quite a shortage in the output of some of the mines is feared. There is some complaint of a scarcity of labor in the mines, and this is expected to become more pronounced the next few weeks, as many men leave the mines to seek employment in the harvest fields of the Northwest. Ore prices at Lake Erie docks, per gross ton, are as follows: Old Range Bessemer, \$4.50; Mesaba Bessemer, \$4.25; Old range non-Bessemer, \$3.70; Mesaba non-Bessemer, \$3.50.

**Pig Iron.**—Only a small quantity has been sold during the week, but there is a fair volume of inquiries for foundry iron for the last quarter and first quarter delivery, and some extending through the first half. Prices are very firm. Some furnace interests are staying out of the market by quoting prohibitive prices on inquiries for deliveries after the first of the year, and others are disposed to limit their sales at present prices. Local furnaces are holding firmly to \$16 at furnace for No. 2 for the balance of the year and sold a small tonnage at that price during the week. For delivery after the first of the year they are asking \$16.50, at furnace, for No. 2. We note the sale of a 400-ton lot,

classified as between No. 1 and No. 2, at \$16.25, for outside shipment, for first quarter delivery. In the Valley the general asking price for No. 2 for the balance of the year is \$15.50 to \$15.75, but it is claimed that very little can be had at the former price. A local furnace received inquiries during the week from northern Ohio consumers aggregating 3000 tons, the largest being for a 1200-ton lot. These inquiries are for the last and first quarter. Another local interest has new inquiries for shipment from an Ohio furnace for 5000 to 6000 tons, for the balance of the year and first half, some being for foundry and the remainder for malleable. Producers regard the outlook optimistically and look for somewhat higher prices. There is little inquiry for Southern iron. We note the sale of a small lot at \$13.50, Birmingham, for No. 1. For the balance of the year we quote, delivered, Cleveland, as follows:

Bessemer.....	\$16.90
Northern foundry, No. 1.....	\$16.75 to 17.00
Northern foundry, No. 2.....	16.25 to 16.50
Northern foundry, No. 3.....	15.75 to 16.00
Southern foundry, No. 2.....	17.35 to 17.85
Gray forge.....	15.25 to 15.50
Jackson County silvery, 8 per cent. sillcon.....	20.05

**Coke.**—The market is quiet but firm. Shipping orders for foundry coke on contract are good but little new business is coming out. On two large inquiries for furnace coke for the first half of next year a local interest has quoted \$2.25 per ton. We quote standard Connellsville furnace coke at \$1.65 to \$1.70 per net ton, at oven, for spot shipment, and \$1.75 to \$1.85 for the balance of the year. Standard 72-hr. foundry coke is held at \$2 for prompt shipment and \$2.15 for the balance of the year.

**Finished Iron and Steel.**—Specifications on contracts for steel bars, plates and structural material continue heavy, and an increasing volume of new business is coming out, particularly for steel bars. The leading interest has advanced its price on steel bars to 1.35c., Pittsburgh, and this is now the minimum quotation. Some contracts for tonnage for delivery the balance of the year are being closed at this price. A good aggregate in current business in steel bars, plates and shapes in small lots is being ordered, and some business for less than car lots is being booked at a premium of \$1 to \$2 a ton. Nearly all the mill agencies report that they are getting further behind on deliveries. Delay in securing shipments from mills has had the effect of largely increasing warehouse business, and jobbers are getting large stock orders that ordinarily would go to the mills. As a result, sales from stock by jobbers have increased materially over last month, although their July sales were heavy. Jobbers are also getting a good volume of mill orders. The demand for sheets continues good and prices are being firmly maintained. The leading interest and some independent mills have made an advance of \$1 a ton on blue annealed sheets, Nos. 9 to 16. Sheet mills are now well filled with orders and shipments are being delayed. In structural material orders from fabricators on contract continue heavy. All the local shops are well filled with work. The only new work that has come out during the week is the Elks' clubhouse, that will require 200 tons. The demand for iron bars continues fairly good. Local mills are getting enough orders to keep them running full, but are not booked for far ahead. Prices are firm at 1.40c. to 1.50c., Cleveland. There is a fair volume of orders for light rails in carload lots from coal mining companies and prices are firm. There is a fairly good demand for forging billets. Local forge shops report considerable increase in business as the result of orders for car forgings. The demand for railroad spikes is holding up well and the base price of \$1.65 is being maintained.

**Old Material.**—The market shows more activity. Dealers report the sale of considerable tonnage in small lots to consumers, but inquiries for large quantities have not appeared. Prices are firm, and an advance of 50c. a ton is noted in heavy melting steel and a few other grades. Dealers are very confident that prices will go higher, and the recent advances have not brought out a great deal of scrap that dealers have been holding for better prices. There does not seem to be a disposition on the part of the mills to contract for extended future deliveries. Dealers' prices, per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails.....	\$16.00 to \$16.50
Old iron rails.....	17.50 to 18.00
Steel car axles.....	19.00 to 19.50
Old car wheels.....	15.50 to 16.00
Heavy melting steel.....	15.25 to 15.75
Relaying rails, 50 lb. and over.....	21.50 to 22.50
Agricultural malleable.....	14.00 to 14.50
Railroad malleable.....	15.50 to 16.00
Light bundled sheet scrap.....	8.00 to 8.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles.....	\$19.00 to \$19.50
Cast borings.....	7.50 to 8.00
Iron and steel turnings and drillings.....	9.50 to 10.00
Steel axle turnings.....	11.00 to 11.50
No. 1 busheling.....	13.00 to 13.50
No. 1 railroad wrought.....	14.50 to 15.00
No. 1 cast.....	13.00 to 13.25
Stove plate.....	11.00 to 11.50
Bundled tin scrap.....	10.00 to 10.50



## Cincinnati.

CINCINNATI, OHIO, August 18, 1909.—(By Telegraph.)

Conditions in the iron and steel markets continue to show improvement. The week opened with large inquiries for 1910 requirements in pig iron, and orders for nearly all forms of structural shapes, particularly those entering into car and bridge building. The tool manufacturers are feeling the impetus of the improvement in general trade. A number are preparing for important improvements, some of which were dropped at the inception of the 1907 depression, and heavy tools are beginning to receive recognition. Much interest is manifested in financial and manufacturing circles over the report received to-day showing comparative receipts to date through the State Willis law, which provides for a tax of one-tenth of 1 per cent. on the paid up capital of corporations. For the quarter just ending the State Treasurer received a total of \$973,112, or \$96,926 more than for the corresponding period last year. It is estimated that the department will close the year, November 15, with \$200,000 more than last year.

**Pig Iron.**—Foundry irons are in greatest demand to-day, the week opening with inquiries ranging from two carloads to 8000 tons, and principally for next year's deliveries. The Southern situation on Monday took on a strong aspect, and \$13, Birmingham, is the absolute minimum for nearby deliveries. The single furnace in the Alabama District making that its open quotation last week having advanced on Monday 50 cents, this places the Alabama output on a uniform \$13.50 plane for No. 2 for any delivery this year. It is admitted that there is still some \$13 iron available on which brokers' commissions are eliminated. This price is doubtless being shaded a little for absolutely spot cash and immediate delivery. While Southern furnacemen have so far consistently refused to open their books for 1910 business, the rapid accumulation of inquiries, coupled with other facts bearing on consumption and production, have operated to suggest to producers the advisability of action, and it is considered practically certain that prices for next year, at least the first half, will be forthcoming on Southern iron ere September 1. A large Michigan manufacturer of radiators is in the market for 7000 to 8000 tons of analysis foundry iron, 500 tons for the last quarter and the remainder during 1910. A Michigan furnace is likely to take this business. A sale of 2000 tons of Southern foundry has just been concluded in the Chicago market, the greater part of it for delivery during the first part of next year. The melters are said to have gotten in at the last minute on the \$13 basis. Five hundred tons of foundry iron, wanted by a south central Ohio tool-maker, is said to have been closed, as also about the same amount of malleable in the same district for the last quarter at a round \$15.50, Ironton. An Indiana manufacturer is in negotiation for 2000 tons of malleable for first quarter. A central Ohio maker of turbines and pumping machinery is asking prices on 2000 to 5000 tons, either Northern or Southern Nos. 2, 3 and 4 foundry for first quarter or half. A large tonnage of Northern basic has been contracted for by an Ohio steelmaker through this market for delivery over a large part of next year. The price is closely guarded, but is believed to be about \$15.50, Ironton. There is no change in Ohio silvers, nor standard car wheel irons, a small tonnage of which comes out daily. For delivery through August and September, based on freight rates of \$3.25 from Birmingham and \$1.20 from the Hanging Rock District, we quote f.o.b. Cincinnati as follows:

Southern coke, No. 1 foundry.....	\$16.75 to \$17.25
Southern coke, No. 2 foundry.....	16.25 to 16.75
Southern coke, No. 3 foundry.....	15.75 to 16.25
Southern coke, No. 4 foundry.....	15.25 to 15.75
Southern coke, No. 1 soft.....	16.75 to 17.25
Southern coke, No. 2 soft.....	16.25 to 16.75
Southern coke, gray forge.....	14.75 to 15.25
Ohio silvery, 8 per cent. silicon.....	19.70
Lake Superior coke, No. 1.....	16.70
Lake Superior coke, No. 2.....	16.20
Lake Superior coke, No. 3.....	15.70
Standard Southern car wheel.....	22.25 to 23.75
Lake Superior car wheel.....	20.50 to 21.00

(By Mail.)

**Coke.**—Taken into consideration with the steadily advancing price of iron, coke at present prices is regarded as low; and the opinion is expressed that producers may order an advance at any moment, if either present troubles over labor in the Connellsville District and combinations of producers assume any stronger proportions. Foundry coke is selling well in small and medium sized lots at \$2 to \$2.25, at even. Furnace grades are quotable as follows: Wise County, \$1.60 to \$1.85; Pocahontas, \$1.75 to \$1.85, and standard Connellsville, \$1.75 to \$2. All districts report a good movement on contract.

**Finished Iron and Steel.**—All interests seem to be together on prices of bars and structural material, and comparatively little evidence is presented of shading or favoritism. The week opened well in the structural line, inquiries coming from jobbers and dealers generally for moderate tonnages for early shipment. The quoted price on this class of material is uniformly 1.40c., Pittsburgh. Steel bars are

firm at 1.35c., Pittsburgh. Specifications on both lines are good, with mills six to eight weeks behind in deliveries on the former, and 60 to 90 days on the latter. Current business in sheets is of a prompt nature at unchanged prices. Mills in this territory are running full. In painted roofing sheets manufacturing interests in this market have for the past 30 days exceeded the volume of sales for three months previous.

**Old Material.**—Dealers' prices to the trade are, for the most part, unchanged, with steel making material heading the list of sellers. A local dealer contracted to-day to furnish a large steel maker with 500 tons per month of heavy melting steel, shipments over the balance of the year, at a price around \$14.50. Select railroad wrought for rolling mills and horseshoe manufacturers is also a good seller. Dealers' prices to the trade are about as follows, f.o.b. Cincinnati:

No. 1 R. R. wrought, net ton.....	\$14.50 to \$15.00
Cast borings, net ton.....	6.50 to 7.00
Heavy melting steel scrap, gross ton..	14.00 to 14.50
Steel turnings, net ton.....	8.00 to 9.00
No. 1 cast scrap, net ton.....	14.00 to 14.50
Burnt scrap, net ton.....	10.00 to 10.50
Old iron axles, net ton.....	18.50 to 19.00
Old iron rails, gross ton.....	15.75 to 16.25
Old steel rails, short, gross ton.....	14.00 to 14.50
Old steel rails, long, gross ton.....	15.00 to 15.50
Relaying rails, 56 lb. and up, gross ton	21.50 to 22.00
Old car wheels, gross ton.....	14.50 to 15.00
Low phosphorus scrap, gross ton.....	14.00 to 14.50

## New York.

NEW YORK, August 18, 1909.

**Pig Iron.**—The market for foundry iron has been fairly active, but buyers and sellers are rather far apart, the former declining in many instances to follow the rapid advance. Somewhat of a scarcity is developing for prompt delivery for which as high as \$17.50 is asked for No. 2 at Eastern furnaces. The Virginia interest which has been out of the market for over a year, and which has been accumulating a large tonnage, is now marketing some iron, current prices having reached the figure at which it was held for a long time. The principal inquiry for pig iron now in the market is one for 8500 tons of foundry iron for delivery during the balance of the year. The buyer, a large electrical company, was supposed to be fully covered for the balance of the year. We quote Northern No. 1 foundry, \$17.50 to \$17.75; No. 2 foundry, \$17.25 to \$17.50; No. 2 plain, \$16.75 to \$17.00. Alabama iron is quoted \$17.50 to \$18.00 for No. 1 and \$17.25 to \$17.50 for No. 2.

**Ferroalloys.**—Prices are a shade lower than last week, but transactions at the new prices brought about by the change of duty have been slight. A sale of a carload of 50 per cent. ferrosilicon for Pittsburgh delivery is reported to have been made at \$65. Larger lots are quoted at \$63.50, duty paid, New York. It is noted in the trade that this level of prices represents about \$50.50 net, at the foreign works, which is pretty close to the cost of production. In ferromanganese a sale of a carload is reported at \$41, Baltimore. Larger lots of 80 per cent. ferromanganese are quoted at \$40 to \$41.

**Steel Rails.**—The North Jersey Construction Company has bought 2000 tons of standard rails for its trolley line between Suffern and Paterson, N. J. In addition to 5000 open hearth rails already reported, which will be rolled at Gary, the Burlington has bought 5000 tons of the Lackawanna Steel Company's ferrotitanium Bessemer rails. The Baltimore & Ohio rail order amounted altogether to 27,200 tons, of which the Bethlehem Steel Company will furnish 2000 tons of open hearth rails. The other portions of this order have been referred to, but the Maryland Steel Company's share was 10,200 tons, while 12,000 tons will be rolled at Edgar Thomson and 3000 tons at Gary.

**Structural Material.**—Ability to make deliveries now has much to do in determining the award of contracts quite as much apparently as price. In the past week about 20,000 tons have been closed in various structural contracts, indicating some lessening of demand. However, considerable business is ahead, chiefly in building lines, and much of it in the West. The opening of bids for the 20,000 tons of steel or more required by the New York, West Chester & Boston came this week after postponement, but no decision has been announced. Locally two loft buildings have been let, one on West Fifty-second street, requiring 2000 tons, to Alfred E. Norton, and the other, on West Thirty-ninth street, 1000 tons, to the Hinkle Iron Works. The Pennsylvania Steel Company and the Virginia Bridge Company will furnish 4000 tons of bridge work for the Winston-Salem Line, which the Norfolk & Western and the Atlantic Coast Line are building. The Southern Iron & Steel Company's new mill building at Gadsden, Ala., will be erected by the McClintic-Marshall Construction Company. The latter company also has the contract for the new Alworth Building at Duluth, Minn., 1000 tons. Other work let in the past week includes 1000 tons for the new Chicago, Burlington & Quincy shops at Havelock, Neb., to the Riter-Conley Mfg. Company;

the National Realty Company Building at Tacoma, 900 tons, to the Des Moines Bridge & Iron Company; the Erie, Pa., Masonic Temple, to T. H. Brooks Company, Cleveland; the Old National Bank at Spokane, Wash., 2800 tons; a coal dock at Superior, Wis., 1800 tons, to Heyl & Patterson, Pittsburgh. The Lehigh Valley is in the market for 1200 tons of structural shapes, which will probably be rolled for the most part at Bethlehem. We continue to quote on mill shipments of plain material 1.56c., delivered at tidewater, while material cut to length is 1.80c. to 1.90c.

**Bars.**—A much better volume of business is now being enjoyed in bar iron. As the result of higher manufacturing costs and the improving demand, prices are higher and quite a number of manufacturers of high grade bars are disinclined to sell at current rates. The lowest quotation on ordinary bars in full assortment is stated to be 1.50c., tidewater, while on bar iron made to railroad specifications, 1.60c. is asked. Steel bars are firmly held at 1.51c. to 1.56c., tidewater.

**Wrought Iron Pipe.**—Trade in this line is very active and all the Eastern manufacturers are 30 to 60 days behind in deliveries. As most of the large manufacturers of steel pipe have their product well sold for the balance of the year, the assertion is made confidently that steel pipe prices will be again advanced before the close of the month.

**Cast Iron Pipe.**—The city of New York will open bids to-day on about 6000 tons of large sizes of water pipe. Awards will be made in three separate contracts, of which two, aggregating 5000 tons, are for the Borough of Richmond, Staten Island, and the remaining 1000 tons will be for Manhattan and the Bronx. Quite a number of orders have been placed within the week, several running up to 500 tons, if not larger. As a result of the better demand prices are now stiffer. Carload lots of 6 in. are quoted at \$23.50 per net ton, tidewater, and it is likely that not much pipe can be had at this price.

**Old Material.**—The market is decidedly strong. A better demand is observed in nearly every line of old material. A great many dealers are not anxious to dispose of any of their stock at this time, particularly of their holdings of heavy melting steel scrap. The action taken by a number of the Eastern steel mills in buying their supply of steel scrap through one firm of dealers is not well received by the trade. A number of the large dealers are not only bitterly opposed to it, but are offering as high, if not higher, prices than the firm in Philadelphia which is buying for the steel companies. It is stated on reliable authority that offers of over \$15, New York, have been refused by some holders of steel scrap. Some of the leading Eastern railroads are also strongly opposed to the action of the steel mills in thus getting together and endeavoring to control the price of steel scrap. Foundry stock is active, some heavy sales having been made. It now looks very much as if the demand is running greater than the supply. An improved tone is observed in relaying rails and several good sized transactions are reported at advancing prices. Quotations are as follows, per gross ton, for delivery in New York and vicinity:

Old girder and T rails for melting	\$14.00 to \$14.50
Heavy melting steel scrap	14.00 to 14.50
Relaying rails	23.00 to 24.00
Standard hammered iron car axles	21.50 to 22.00
Old steel car axles	19.00 to 19.50
No. 1 railroad wrought	16.50 to 17.00
Iron track scrap	15.00 to 15.50
No. 1 yard wrought, long	14.50 to 15.00
No. 1 yard wrought, short	13.50 to 14.00
Light iron	8.50 to 9.00
Cast borings	9.00 to 9.50
Wrought turnings	10.50 to 11.00
Wrought pipe	12.50 to 13.00
Old car wheels	15.00 to 15.50
No. 1 heavy cast, broken up	14.00 to 14.50
Stove plate	12.00 to 12.50
Locomotive grate bars	12.00 to 12.50
Malleable cast	15.00 to 15.50

Heyl & Patterson, Inc., Pittsburgh, have been awarded a contract by the Carnegie Coal Company for the construction of one of the most modern and rapid loading and unloading docks on the upper lakes, at Duluth, Minn. It is expected that the dock will be completed by November of this year and that soon thereafter 75,000 tons of coal will be unloaded on it for the winter season. The dock will have a storage capacity of 500,000 tons in addition to the normal handling of coal to cars. The daily handling capacity of the dock will be 10,000 tons.

The Alice Furnace, Sharpsville, Pa., recently bought by the Thomas D. West Foundry Company from the Youngstown Sheet & Tube Company, adjoins the foundry property and will be operated on special Bessemer pig iron for ingot molds.

## Iron and Industrial Stocks.

NEW YORK, August 18, 1909.

The strength of the market was well maintained for the greater part of the past week. In some stocks new high records were made, notably in the case of United States Steel common, which touched 78½. Profit taking was probably the cause of some recession. The range of prices on active iron and industrial stocks from Thursday of last week to Tuesday of this week, on which latter day the lowest prices were realized, has been as follows:

Allis-Chalm., com.	15¼-15½	Railway Spr., com.	48-52½
Allis-Chalm., pref.	53¼-55½	Railway Spr., pref.	106¼-108
Beth. Steel, com.	31¾-33¼	Republic, com.	38-39½
Beth. Steel, pref.	64¼-65¾	Republic, pref.	105¼-109
Can, com.	12½-13¾	South. I. & S., com.	20-20¾
Can, pref.	83-85¼	South. I. & S., pref.	55¼-57½
Car & Fdry, com.	65¾-69¾	Sloss, com.	84½-87¾
Car & Fdry, pref.	120½-121¾	Pipe, com.	33-33¼
Steel Foundries	59-61	Pipe, pref.	84-85½
Colorado Fuel	44-47½	U. S. Steel, com.	76¾-78½
General Electric	168-172½	U. S. Steel, pref.	125¼-128
Gr. N. ore cert.	84¾-88½	Westinghouse Elec.	85½-89
Int. Harv., com.	88¾-89¾	Chl. Pne. Tool.	26-31½
Int. Harv., pref.	121-121½	Cambria Steel	44½-45½
Int. Pump, com.	40-42½	Lake Sup. Corp.	26-27¼
Int. Pump, pref.	87½-88½	Penn. Steel, pref.	114½-116
Locomotive, com.	63¾-68½	Warwick	9-9½
Locomotive, pref.	120-121½	Crucible St., com.	12¼-13½
Nat. En. & St., com.	16¼-17¾	Crucible St., pref.	76¾-81½
Nat. En. & St., pref.	89¾-94½	Har.-Walk. Ref. com.	27-30
Pressed St., com.	49-53	Har.-Walk. Ref. pref.	91-95
Pressed St., pref.	107-110¼		

Last transactions up to 1.30 p. m. to-day are reported at the following prices: United States Steel common 77½, preferred 125¼, bonds 107; Car & Foundry common 66¼, preferred 120½; Locomotive common 65, preferred 120; Steel Foundries 59½; Colorado Fuel 45½; Pressed Steel common 50¾, preferred 107; Railway Spring common 50½; Republic common 38¼, preferred 107; Sloss-Sheffield common 85½; Cast Iron Pipe common 33¼, preferred 87; Can common 13¼, preferred 84½.

## Iron and Steel Bonds.

Chisholm & Chapman, 18 Wall street, New York, report the following quotations:

	Bid.	Asked.
Bethlehem Steel 1st ext. 5s, due January, 1926	88	89¾
Bethlehem Steel purchase money 6s, August, 1908	117	118
Buffalo Iron 5s, October, 1925	95	100
Buffalo & Susquehanna Iron 1st 5s, June, 1932	99¾	100
Buffalo & Susquehanna Iron deb. 5s, January, 1926	94	96½
Dominion Iron & Steel 5s, July, 1929	96½	97½
La Belle Iron Works 1st 6s, December, 1923	104½	104½
Lackawanna Steel 1st 5s, April, 1923	98½	99¼
Maryland Steel 1st 5s, February, 1922	102	103
Pennsylvania Steel 1st 5s, November, 1917	102	102
Pennsylvania & Maryland Steel 6s, September, 1925	101½	110¼
Republic Iron & Steel 1st 5s, October, 1924	101½	102½
Sloss Iron & Steel 1st 6s, February, 1920	106	108½
Sloss Iron & Steel consol. 4½s, April, 1918	94½	97
Jones & Laughlin Steel 1st 5s, May, 1939	102½	102½

## United States Steel Corporation.

Collateral Trust 5s, Series A, C, E, April, 1951	114¼	115¼
Collateral Trust 5s, Series B, D, F, April, 1951	114¼	115¼
Sinking Fund 5s, April, 1963	106½	106¾
Union Steel 1st 5s, December, 1952	105½	106
Clairton Steel 5s, 1908-1913	101	101
St. Clair Furnace 1st 5s, 1910-1939	101	101
St. Clair Steel 1st 5s, 1908-1926	101	101
Illinois Steel deb. 5s, January, 1910	100¼	100¼
Illinois Steel 5s, April, 1913	100¼	100¼

All bonds quoted "and interest."

The stockholders of the International Steam Pump Company at their special meeting, August 12, authorized the issue of \$12,000,000 5 per cent. bonds. The proceeds from the sale of the bonds are to be used for the retirement of the company's outstanding debentures, discharge of floating debt, additions and improvements and other purposes. It is stated that bonds of the value of \$8,000,000 have already been sold to William Salomon & Co., New York, the balance being reserved for future requirements.

The directors of the Lake Superior Corporation announce that there is no net income for the fiscal year ended June 30 applicable to the payment of interest on the income bonds of the corporation. The report for the year ended June 30, 1909, shows the surplus after charges to have been \$22,995; decrease, \$4874.

**Dividends.**—The United States Cast Iron Pipe & Foundry Company has declared a quarterly dividend of 1¼ per cent. on the preferred stock, payable September 1.

The National Enameling & Stamping Company has declared the regular dividend of 7 per cent. for the year on the preferred stock, payable in four equal installments of 1¼ per cent. on the last day of each quarter, beginning September 30.

The General Electric Company, Schenectady, N. Y., has secured a contract from the Illinois Steel Company for a 7000 kw. low pressure steam turbine unit for installation at the South Chicago Works. This unit will take exhaust steam from the present generating plant and from the steam blowing engines and will operate at 16 lb. absolute pressure.



## Metal Market.

NEW YORK, August 18, 1909.

**Copper.**—Last week's flurry subsided completely, almost immediately after its birth. This week has been a quiet one, consumers showing a disposition to allow matters to settle back to normal. Business consequently was but nominal. Sellers, on the other hand, sustained values very well, holding to their quotations of 13.50c. to 13.75c. for Lake and 13.25c. for electrolytic even at the loss of business. The London market fluctuated considerably, showing the same unsettled state there that exists in this market. While in some quarters it is held that the position of the metal is not so good as it was supposed to be a week ago, the firmness of prices throughout the week indicates that the situation is in strong hands. The fact that the general business situation shows so much improvement will doubtless prove a strong advantage to the interests that are upholding copper values. The European statistics show an increase in the visible supply of 4300 tons. Exports have fallen off considerably, as thus far this month they amount to only 11,580 tons. On this basis it is safe to figure that the total exports for the month will aggregate from 20,000 to 25,000 tons. This would show a falling off of 10,000 to 15,000 tons for the month. On the New York Metal Exchange at the close to-day, standard copper suffered a decline, as compared with last week, it being quoted at 12.65c. to 12.85c. Twenty-five tons for December delivery was sold at 13c. London showed a decline at the close to-day, naming £59 12s. 6d. for spot, £60 11s. 3d. for futures, and £62 10s. for best selected.

**Pig Tin.**—General firmness and a steady tendency toward higher prices characterize the market this week. The demand for consumption from the interior is said to have been very good, although no individual transactions of importance are reported. Shipments during the first half of the month have not been large. While the arrivals so far this month were fair, amounting to 2594 tons, the amount of the metal afloat is said to be but 1068 tons. The London market has been rather quiet, but this morning an advance of 15s. was cabled, which is attributed to the firm closing of this market yesterday. At the closing call on the New York Metal Exchange the market stood 29.97½c. to 30.07½c. Twenty-five tons was sold at 30c. for September delivery. The London market showed still further advances, with £136 7s. 6d. for spot and £137 12s. 6d. for futures. Prices during the week were:

	Cents.
August 12.....	29.80
August 13.....	29.70 to 29.75
August 16.....	29.85 to 29.90
August 17.....	29.90 to 29.95
August 18.....	29.97½ to 30.07½

**Lead.**—The market has been firm, especially on future deliveries, for which buyers were willing to pay a premium above the price of 4.40c., which is maintained by the leading producers. The London market named an advance, quoting £12 10s. At the close to-day spot New York lead was quoted 4.35c. to 4.40c. Sales made at the New York Metal Exchange were as follows: 200,000 lb. September delivery at 4.45c.; 200,000 lb. October delivery at 4.47½c. The price quoted for East St. Louis delivery was 4.25c. bid.

**Spelter.**—Prices are a shade higher and the market is very firm. A fair business is reported for consumption. The closing price here was 5.75c. and East St. Louis quotes 5.60c. bid. London is unchanged at £22.

**Antimony.**—The market is dull and unchanged here, but London has suffered another decline of 10s. Quotations here are as follows: Cookson's, 8.50c., Hallett's 8c. to 8.25c., other brands, 7.25c. to 7.50c.

**Tin Plates.**—There is no change as to present conditions, but it is reported that an advance of 15c. per box is to be announced for next year's delivery. Quotations for 100 lb. I C coke plates for delivery this year remain unchanged at \$3.64 per box. The Swansea market is unchanged at 11s. 9d.

**Old Metals.**—The following dealers' selling prices represent the New York market:

	Cents.
Copper, heavy cut and crucible.....	12.50 to 12.75
Copper, heavy and wire.....	12.25 to 12.50
Copper, light and bottoms.....	11.25 to 11.50
Brass, heavy.....	9.00 to 9.25
Brass, light.....	7.00 to 7.25
Heavy machine composition.....	11.25 to 11.50
Clean brass turnings.....	8.00 to 8.25
Composition turnings.....	9.50 to 9.75
Lead, heavy.....	4.10 to 4.15
Lead, tea.....	3.75 to 3.80
Zinc scrap.....	3.75 to 3.87½

**Sheet Zinc.**—The ruling price of sheet zinc advanced on the 14th instant to \$7.50 per 100 lb., basis, less 8 per cent. discount, f.o.b. cars Peru, Ill. Extras and discounts remain unchanged.

L. Vogelstein & Co., 42 Broadway, New York, give the following figures of German consumption of foreign copper for the months of January to June, 1909:

	Tons.
Imports of copper.....	80,061
Exports of copper.....	3,913
Consumption.....	76,148

The consumption during the same period in 1908 was 79,090 tons. Of the above quantity 73,416 tons were imported from the United States.

## The Youngstown Foundry & Machine Company.

At a meeting of the directors of the Youngstown Foundry & Machine Company, recently held at Youngstown, Ohio, the following officers were elected: W. J. Wallis, president and general manager; F. A. Williams, vice-president and manager of sales; B. G. Parker, secretary and treasurer. The officers reported that the roll business of the company had increased so rapidly during the past few years that it was necessary to make improvements to take care of the increased trade. The steel foundry now located on East Boardman street, which has not been operated for some time, is to be completely overhauled, and will be made into a plant for the exclusive manufacture of sand and chilled rolls of every size and description. The main building, which is 90 x 190 ft., is already equipped with three electric traveling cranes. The company will install one 25 and one 15 ton air furnace, a 25-ton cupola and a number of roll lathes and other machinery which will be expected to place it among the foremost manufacturers of rolls for sheet and tin mills, as well as rolls for all other purposes. By concentrating the manufacture of rolls at the East Boardman street plant additional capacity will be given at the Reserve street plant, which is devoted to the manufacture of castings for rolling mills and blast furnaces, as well as rolling mill machinery.

## The Colburn Machine Tool Company's Chicago Representation.

The Colburn Machine Tool Company, Franklin, Pa., builder of vertical boring and turning mills, announces that after September 1 it will be represented in Chicago territory by the E. L. Essley Machinery Company, 62 West Washington street, Chicago. Charles M. Robertson, formerly superintendent of the plant of the Colburn Machine Tool Company, and who has had a large and varied experience in the manufacturing and selling of vertical boring mills, will be associated with the Essley Company as special representative and expert. A line of boring mills will be carried in stock in Chicago and machines will be shown at the store belted up and running. This will enable prospective customers not only to see the machines, but also to see them demonstrated by an expert as well. The Colburn Company has recently brought out an entirely new line of vertical boring mills, which are known as its new model type.

The Sharon Steel Hoop Company, Sharon, Pa., has increased its capital stock from \$1,000,000 to \$2,500,000. A considerable portion of the additional funds will be devoted to plant improvements, the character and extent of which have not yet been finally determined. The Board of Directors has been enlarged from five to seven members, Charles Bachman and E. Thatcher being the two new members.

In the two weeks ending August 4 the number of idle cars, as reported to the American Railway Association, was reduced by 36,181, or from 243,354 on July 21, to 207,173. This is the largest reduction in any fortnight since September, 1908. The maximum surplusage was 413,338 cars April 29, 1908. On January 6, this year, the number of cars idle was 333,019.

C. M. McKenney and W. G. McKenney of McKenney & Co. and Charles A. Locke, all of Pittsburgh, will the latter part of this month apply for a Pennsylvania charter and change the firm name to McKenney Iron & Steel Company, for the purpose of buying and selling new and second-hand iron and steel products. The present business is expected to be considerably expanded.

Preparations are being made for blowing in one of the Columbus, Ohio, furnaces of the Carnegie Steel Company, and it will probably be ready early in September.

## The Public Supply of Electric Power in Great Britain.\*

BY G. L. ADDENBROOKE.

Some conception of the extent to which power is at present used in Great Britain and the proportion of it which has already been electrified may be had from the report of the late Coal Supply Commission.

According to this report there were used in 1903 about

53,000,000 tons of coal in factories.  
18,000,000 tons of coal in mines.  
13,000,000 tons of coal in railroads.  
5,000,000 tons of coal in brick and chemical works.  
28,000,000 tons of coal in iron and steel works.  
15,000,000 tons of coal in gas works.  
32,000,000 tons of coal in domestic purposes.

And probably these figures are not far from correct now.

Of course, a great deal of coal is used for heating, but, taking this into consideration, it would appear, from the above and other data, that the total horsepower installed in the United Kingdom in factories and mines is something under 9,000,000 hp., including gas engines, and there is also about 1,300,000 hp. installed in electric lighting, power and tramway stations.

To estimate the amount of power used on railways is not easy owing to the difficulty of defining what is the horsepower of a locomotive; but it would appear that if the railways of the United Kingdom were all driven electrically with power supplied from large generating stations, the horsepower required would be well under 2,000,000. As an interesting side issue, it may be worth noting that there must also be much over 500,000 hp. installed in motor cars and motor omnibuses in this country at the present time, and that this total is certain to be greatly increased in the near future. These figures must be taken as very approximate, but in the absence of more definite information they are useful in giving some idea of the magnitude of the problems involved. This is in the neighborhood of  $\frac{1}{4}$  hp. for each person for all purposes. The writer considers that this is rather an over than an under estimate, as he invariably finds that power users have a tendency to exaggerate the amount of power they use and to underestimate the amount of coal used per horsepower hour.

In the United States it has been usual for some time to take a power census every five years. Without going into detail it may be said that the figures for 1905 showed a total of nearly 15,000,000 hp. in use, including water power, the figures for electric supply being for the same year about three times those for this country. The United States population is, of course, double that of Great Britain, but nevertheless these figures are worthy of consideration.

Out of the 8,000,000 to 9,000,000 hp. employed in the mines and manufactures of Great Britain, probably 70 per cent. is situated within populous districts, since over 78 per cent. of the population live in such districts, and manufactures, mining and population are always closely associated. Some of this power is not suitable for conversion to electric driving, and some has already been converted, but probably there is at this moment in Great Britain over 4,000,000 hp. of engines situated in towns and urban districts and their neighborhoods, and within the central portions of the areas of the power supply companies who have been granted acts for this purpose.

To give an idea of the economies to be effected if the best modern practice were generally adopted for generating power, the Coal Commission estimated that if electric driving and the most modern plant were universally substituted in collieries for the plant at present in use, the coal consumption, which now is more than 6 per cent. of the total coal raised, would be reduced to one-third, and it is safe to say that if electric main winding, which is now coming into use, were also adopted, and if the supply were furnished by grouped

stations where practicable, even this economy would be exceeded, so that there would be a saving of coal in this industry alone of some 12,000,000 tons, which at the low value of 5s. (\$1.00) per ton, would effect a saving of £3,000,000 (\$15,000,000) per annum.

The saving of coal by adopting electric driving and grouping the power supply as far as possible would not be so great in other industries as in mining, but it is a moderate estimate of what we know the savings to be by grouping or using the most efficient modern isolated plant to say that the coal consumption, taking all other industries, could on an average be reduced to half of what it is now, or by over 20,000,000 tons per annum, of an average value of nearly £10,000,000 (\$50,000,000), if carriage and handling is included. The annual cost of this power at the average figure of £6 (\$30) per horsepower, including interest and depreciation, is for all industrial purposes in excess of £50,000,000 (\$250,000,000) per annum.

## The British Iron Trade.

A slight improvement in the pig iron market, with some advance in price, is noted in British iron trade reports. Early in the present week the price of Cleveland warrants was 50 shillings 3 pence, representing an advance of about 1 shilling since the beginning of the month. The improvement in the American iron trade has been an influence, but what is more desired by British iron masters is some betterment in the German iron trade, since Germany in good times is the chief foreign outlet for Middlesbrough iron. Pig iron stocks in warrant yards at Middlesbrough were 259,171 tons at the close of July, the increase for that month being 21,289 tons. Since July 1, 1908, warrant stocks have been increasing uninterruptedly. On that date they were at the minimum since 1900, or 47,949 tons.

The finished iron and steel trade in Great Britain continues dull. Some works were shut down through the first week in August. Rail mills have booked few important orders, the only one of prominence in recent weeks being for 25,000 tons for export, though early in August the Belgian mills took 20,000 tons for Siam and 13,000 tons for Argentina. The shipyards are still slack. The report of the Ship Constructive and Shipwrights' Association for the second quarter of the year showed that of that union's 21,000 members 5000 were unemployed throughout the quarter. In the common bar trade business has been poor, few mills having orders for more than one or two weeks in advance. Advances received by some British firms having business connections in Germany indicate a slight improvement there, representing, perhaps, the beginning of the effect to be expected from the prevailing activity in the United States.

**An Automobile Company's Expansion.**—In order that it may control all facilities necessary for the construction of automobiles, the E-M-F Company, Detroit, Mich., has purchased the plant of the Western Malleable Steel & Forge Company, which has during the past three years followed the trend of demand and gone into the drop forging line on a large scale, and that of the Monroe Body Company, Pontiac, Mich. Besides these the company has also purchased the plant of the De Luxe Automobile Company. The company expects to turn out 40,000 cars during the next season.

A New Castle, Pa., dispatch of August 12 says that 56 of the striking employees of the American Sheet & Tin Plate Company's plants in that city were served with summonses to appear before the United States Circuit Court at Pittsburgh in September to defend a suit for \$200,000 damages, entered by the company. The bill of particulars recites that the company has \$10,000,000 invested at New Castle and employs 3000 men; that the defendants have conspired to prevent 3000 employees from working; also that the profits of the company have been affected by the actions of the defendants in preventing it from operating its plants.

\* Abstract of Cantor lecture delivered before the Royal Society of Arts, and published in the *Proceedings* of the society.



## The Machinery Trade.

NEW YORK, August 18, 1909.

The activity in the machinery trade abated somewhat the past week, and none of the large corporations was reported to have come into the market for other than a few tools. The orders and inquiries came from various sources and the aggregate was probably not quite as large as that of similar recent periods. While some houses report a continued expansion in the demand, there are others whose business is not as good as it was last month and who will have to receive additional orders to make a favorable comparison with July. This slight check to the activity started some time ago is attributed generally to the vacation period and is not viewed with any apprehension as to the course of business in the fall when it is fully expected a pronounced upward movement will take place. At that time it is hoped that more of the deferred projects will be taken up and the eastern railroads which have bought very little tool equipment in the past year or more will come into the market. The rise in the prices of some commodities is viewed with alarm by machinery houses lest it tend to stop buying. The manipulation of stocks to a high level on the Stock Exchange is also considered a menace. The demand for small power units is fairly active in this territory, much of the business coming from the new office buildings, hotels and such structures rather than from manufacturing plants.

Indications are that orders will be placed within the next few days against the extensive list of machine tools for the new shops of the Central of Georgia Railroad at Macon, Ga. This list was sent out a few weeks ago through the purchasing agent of the Illinois Central Railroad, and it is likely that merchants in this territory will receive some of the business. Quotations have lately been asked on some of the machines without the motor drives, indicating that the road is in a hurry for the machines. The new shops being erected at Macon are of considerable size and it is thought that additional machinery from that on the list will have to be purchased to complete the equipment.

The Raleigh & Southport Railroad, Raleigh, N. C., has purchased two blocks of property as a site for a new terminal, which will include repair shop, freight yard, round-house and freight depot. The company will spend between \$40,000 and \$45,000 on the improvements. J. A. Mills is president and general manager.

A large plant is to be erected at Newell, Pa., by the General Chemical Company, New York, for which considerable new machinery will be required. It is not likely that much in the way of iron working machinery will be needed, but quite a little equipment, such as engines, generators, pumps and conveying machinery will be required. Power will be furnished by gas engines, operated by natural gas. Plans and specifications are about completed for the plant, which will consist of six or eight buildings of considerable size and of brick and concrete construction.

While it has not yet been fully determined, it is probable that only elevating and conveying machinery for bags and barrels will be installed in the new building being erected by Arbuckle Bros., Brooklyn, N. Y. The building will be 200 ft. sq., 10 stories, of concrete construction, covering the entire block between Jay, John, Pearl and Plymouth streets.

With a capital stock of \$25,000, the Frank F. Smith Metal Hardware Window Company was incorporated in New Jersey last week. The headquarters and plant of the company are located at 19 Division street, Newark, N. J. The new organization has taken over the plant and business of Frank F. Smith. The officers of the new company are as follows: President, Frank F. Smith; vice-president, John C. Eisele; treasurer, John L. Eisele; secretary, Charles R. Smith. Frank F. Smith will serve as general manager, as he was the founder of the business and doubtless the pioneer manufacturer of special hardware made for the automatic operation of fireproof windows, according to the approved lines of the American Fire Underwriters' Association. The incorporation of the business became necessary, owing to its large growth, and it is understood that the present capital of \$25,000 is soon to be increased so as to permit for plant enlargement and a general extension of the business to meet the demands for the product. John C. Eisele, the vice-president, is one of the most prominent and successful financiers in New Jersey, being actively associated with the most important financial institutions of the State.

J. J. Brown, formerly sales manager of Henry R. Worthington, Inc., has been made vice-president and general manager of the Wheeler Condenser & Engineering Company, Cartaret, N. J., and 90 West street, New York, succeeding W. E. Volz, who recently resigned. The Wheeler Condenser & Engineering Company is about to ship what is said to be the largest surface condensers ever made to the City Electric Company, San Francisco, Cal.

One of the most active features in the present industrial

situation is the demand for pumping machinery from municipalities where bonds have been voted for the creation of new water works systems. Among these, active construction will be entered upon in the near future by the following: Cartersville, Mo.; Lisbon Falls, Maine; Macomb, Ill.; Virginia, Ill.; Freeburg, Ill.; Lyon, Miss.; Abita Springs, La.; Batesville, Miss.; Barley, Idaho; Seymour, Texas; Idaho Falls, Idaho; Breda, Iowa; Kent, Wash.; South Paris, Maine; Newburgh, N. Y.; La Grande, Ore.; Fort Riley, Kan.; Beaver City, Neb.; Mount Healthy, Ohio; Russell, Kan.; Jellico, Tenn.; Wakeeney, Kan.; Elkhorn, Neb.; Fort Gibson, Okla.; Perry, Ga.; Winnsboro, Texas; Anson, Texas; Albemarle, N. C.; Paragould, Ark.; Minco, Okla.; Canyon City, Texas; Bottineau, N. D.

The Board of Water Commissioners of Perth Amboy, N. J., will receive bids until September 1 for a 12,000,000 gal. pumping engine to be installed in the pump house at Runyon.

According to a statement issued by the Public Service Commission, New York, bids will be asked in the near future for the following subway extensions and new routes. For construction alone: Lexington avenue route, River avenue route, Jerome avenue elevated route, Southern boulevard and Westchester avenue route, Canal street route, Manhattan Bridge route revised, Brooklyn loop lines from Williamsburg Bridge to Ashland place. For equipment and operation in case of construction alone: Lexington avenue route, River avenue route, Jerome avenue elevated route, Southern boulevard and Westchester avenue route, Canal street route, Manhattan Bridge route revised, Brooklyn loop lines, Fourth avenue route, Bensonhurst, Bath Beach and Coney Island route. For construction, equipment and operation with private capital, ownership of road vested in the city: Lexington avenue route, River avenue route, Jerome avenue elevated route, Southern boulevard and Westchester avenue route, Canal street route, Manhattan Bridge route revised, Brooklyn loop lines from Williamsburg Bridge to Ashland place, portion of Fourth avenue lines from Forty-third street to Fort Hamilton, and the Bensonhurst, Bath Beach and Coney Island branch from Forty-third street to Coney Island. For equipment and operation: Portion of Brooklyn loop lines now under construction, including Williamsburg and Manhattan bridges; Fourth avenue route to Forty-third street.

**Catalogues Wanted.**—The Century Engineering Company, Ogdensburg, N. Y., which is about to start a foundry, would like to receive catalogues of foundry equipment and accessories.

## Chicago Machinery Market.

CHICAGO, ILL., August 17, 1909.

The machinery trade continues to reflect the general improvement in business conditions throughout the West. The volume of orders is steadily increasing, and the demand shows a satisfactory tendency to broaden out into all lines of factory and railroad machinery. Officials of the important Western railroads already admit that they anticipate a car shortage this fall, and this condition has awakened greater activity in car shop work. Manufacturers are feeling more confidence in the future each week and this is reflected in the number of orders and inquiries for general shop machinery. The excessive economy of the past year and a half will undoubtedly lead to a great deal of trouble in the near future in getting deliveries from the machinery manufacturers, a condition that has already appeared in some lines, as noted last week in this market. The agricultural implement makers have done more business in the past year than ever before, and are in the market with a large number of scattering inquiries for renewals and extensions of shop equipment. Other industries which have been lagging behind are beginning to feel the quickening impulse of the general revival in trade, and many plans for new shop construction that have been held in abeyance are assuming tangible form. There have been no notable developments during the past week, but a general improvement all along the line in orders and inquiries is noted.

The Buhl Malleable Company, Detroit, Mich., has purchased the Western Malleable Steel Company, together with its contracts, &c. The Buhl Company will continue the manufacture of steel castings at the Western plant until October 1, when a new steel foundry will be completed, consisting of two new buildings, one 90 x 115 ft., and the other 65 x 280 ft. The company will be able to fill all contracts now existing and make prompt delivery to the customers of the Western Malleable Steel Company.

Morton & Gunlock, Quincy, Ill., makers of hardware specialties, are increasing their factory facilities and are in the market for a few tools, including a two-spindle drill and riveting machine.

The Peters & Edholm Company, Omaha, Neb., has been incorporated with a capital stock of \$100,000 to deal in

new and second-hand machinery, mill, factory, ice plant, laundry and creamery supplies.

The Hastings Foundry & Iron Works, Hastings, Neb., manufacturer of structural and ornamental iron and steel, has purchased a new site on which a new plant will be erected to take care of the rapidly increasing business. Besides the main building the company will erect a structural steel room, 50 x 100 ft., and a foundry, 50 x 100 ft.

H. L. Rice, Park Rapids, Minn., has let a contract to the Power Engineering Company, Minneapolis, Minn., for the construction of a hydro-electric plant at that place, for which Mr. Rice will buy two direct current generators of 100-kw. capacity. The Power Engineering Company will furnish all other material necessary for the equipment of this plant.

The University of Colorado, Boulder, Colo., now has in course of construction a heating, lighting and power plant, which will cost approximately \$70,000. Plans for the building contemplate a boiler room, 40 x 74 ft., to accommodate boilers of 1200 hp., and an engine room, 50 x 86 ft. Plans for the new plant are so arranged that in the future when more power is required a boiler room and stack of similar capacity may be erected on the south side of the engine room. Other improvements to be made by the university include the central portion of a new scientific and museum building to cost \$70,000, law building \$50,000, and auditorium \$300,000. Wings to be added to the science and museum building later on will cost \$36,000.

Bids will be received by the County Commissioners of Silver Bow County, Butte, Mont., until August 23 for three 200-hp. high pressure boilers for the new Silver Bow county jail.

Improvements now in course of construction by the Oregon Power Company, Sterling, Ill., include the installation of six 68-in. Leffel water turbine wheels, two 600-kw. alternators and one 500-hp. engine, all of which have been bought. The company, however, is in the market for new boilers sufficient to develop about 1000 hp.

The Freeborn Engineering & Construction Company, Scarritt Building, Kansas City, Mo., has secured a contract at Osage City, Kan., for the construction of a municipal water works system to cost \$30,500. Plans include the construction of dam, power house, pipe line, &c.

F. J. Rapp, superintendent of the Mason Electric Light & Water Works, Mason, Mich., advises that on August 16 the City Council will decide whether or not a new dynamo is to be installed in the plant.

At a special election held for that purpose, the citizens of Sulphur Springs, Colo., voted to install a water works system, the cost of which will be \$10,000.

A bond issue for \$21,000 for a water works system has been voted by the village of Sargent, Neb., but plans for this improvement have not been completed. F. L. Hicks is chairman.

A committee has been appointed at Fithian, Ill., to arrange for the installation of a water works system and electric light plant. None of the equipment for these improvements has been purchased as yet.

Funds in the sum of \$17,000 have been voted by the village of Valley, Neb., \$12,000 of which is to be used for the construction of a water works system and \$5000 for an electric light plant. Plans and specifications for these improvements are now being prepared. Albert C. Hedberg is Village Clerk.

## Milwaukee Machinery Market.

MILWAUKEE, WIS., August 17, 1909.

As predicted recently there has, in consequence of the settlement of the tariff question, been an immediate quickening of trade here along many lines. Orders for supplies placed last week by some of the leading manufacturers of this section of the State were of considerable magnitude, and several purchasing agents have expressed the belief that, at the prices at which they were closed, these contracts will have netted their companies an appreciable profit by the time the material has been used. Most of the larger contracts include orders not only for certain quantities to be delivered by specified dates; but also the option of accepting more on the same terms within a certain number of weeks. All of the officials interviewed expect to take advantage of these options, and it was the understanding that they would probably do so which largely determined favorable conditions of sale, as it enabled the supply men to plan with greater certainty for the future.

Confirmation of the other side of the story is also obtainable locally, for, while no raw materials of consequence, with the exception of clays and limestone, are produced in this immediate section, Milwaukee capitalists, including some of the large manufacturers themselves, have heavy investments elsewhere in the country. Upon inquiry, it develops that the movement from the mines, mills, furnaces and smelters under the entire or partial control of Wisconsin

interests will be extremely liberal during the fall months, taking, as a basis, contracts already entered into, as well as others now pending, which are reasonably certain to be closed within the coming fortnight. Coking operations here are also very active, and the three blast furnace plants have every prospect of a good season ahead.

A feature which continues to give strength to the local market is the urgent character of the demand for automobile parts and specialties, including steel castings. Manufacturers here state that there is not a motor-producing district of the country which they are not partially supplying. The same is true with reference to machine tools and other equipments needed in this industry, and at the present time some of the smaller shops through this section are practically given over to that class of trade.

This, too, is the beginning of the season when electric railways, central power and lighting stations, municipal plants, pumping stations and other public service corporations usually make contracts for six months or a year, beginning September 1, and so much equipment was suffered to deteriorate during the period of financial depression that uncommonly heavy purchases will have to be made in the near future. A large section of Wisconsin's industries will be kept in a thriving condition by this character of trade alone. The influence of buying for the steam roads is also becoming more and more felt and will be referred to in greater detail later on.

The Progressive Metal & Refining Company, Milwaukee, will take bids shortly on the erection and equipment of a new plant, 80 x 160 ft., of steel, concrete and brick construction.

The Koehring Machine Company, Milwaukee, is having plans drawn for a new machine shop, 160 x 200 ft. Power and machinery requirements can be learned by addressing the company.

A controlling interest in the Mashack Iron & Chemical Company, Lake Superior & Escanaba Railroad Company, I. Stephenson Company and Ford River Company, all of Menominee and Wells, Mich., has been purchased by H. A. J. Upham, Milwaukee. Extensive betterments will be gradually entered upon, new buildings erected and improved equipment purchased. No details as to machinery requirements are, however, obtainable at this time.

The Constantine Mfg. Company contemplates erecting a factory, 80 x 300 ft., at Madison, Wis.

The Admiralty Board of Great Britain has awarded a contract to the T. L. Smith Company, Milwaukee, for machinery to be used in the concrete construction of the great Rosyth harbor of refuge and naval fare. Six Symons crushers will be furnished.

## Cincinnati Machinery Market.

CINCINNATI, OHIO, August 17, 1909.

While the tone of the machinery and tool market is firm and encouraging and the sales in spots quite satisfactory, the last half of the month will be required to present a record of sales exceeding that of the first half if August is to equal July's splendid performance. One very encouraging feature is the optimism of the dealer who is stocking up in all directions. Where three months ago he bought machines singly and to supply his customer only, to-day a number of the largest concerns are hurrying shipments of standard tools for the stock floor.

Lathes are holding their own and the upright drill continues a prime favorite. Milling machines are also a strong seller, all concerns making them being behind on deliveries from six to eight and 10 weeks at this, the ordinarily dull, period of midsummer.

The automobile manufacturer continues the largest trade patron of the tool establishments. One of the largest producers in Michigan is buying a splendid list of tools, such as lathes, drills, shapers, &c., and it is expected that this list will be closed this week. It is expected that the greater part of this order will come to this market.

The wood working machinery interests are improving rapidly; nearly all are installing new and additional machinery and tools, and the tone of that market is very strong.

A large local concern, claimed to be the largest wood working machinery plant in the world, has just purchased about \$5000 worth of new tools, the greater part of which list represents standard types of tools, such as shapers, lathes, &c., this order, the major portion of it, going to the American Tool Works Company.

The Cincinnati-Bickford Tool Company is working to its capacity of forces and time on upright and radial drills, the new heavy duty, upright for high speed steel, which was demonstrated at Atlantic City in May, enjoying a phenomenal run. The Bickford Standard radial is also gaining in interest.

Deliveries on lathes, millers, shapers and drills are now from six to eight weeks behind, and in a few special cases eight to 10 weeks. Two things contribute to this condition,



which scarcely any manufacturer felt would be a feature of the dull and usually featureless days of midsummer. For the past year and a half or two years machine tool manufacturers have for the most part kept their skilled forces together, employed these workmen on special things, such as automobile parts, designing crank shaft, hub and other types of lathes or lathe attachments demanded by the rapid growth of the automobile industry. A number of the largest shops manufacturing lathes and shapers were caught this spring and summer when the betterment in trade began with a lot of this class of work on hand. These shops are now getting rid of this special work as rapidly as possible and turning their attention to their own standard designs. The other cause of the shop stagnation is difficulty in securing the skilled mechanics of whom there were plenty when the slump of 1907 came, but who have been dissipated in every direction in the interval—some to go with the automobile concerns at high pressure wages, some taken by the National Metal Trades Association Employment Bureau to fill vacancies in other parts of the country, and some to enter other trades and employment.

The John B. Morris Foundry Company enjoyed a fine run of business during the week. Sales averaging two lathes a day for the entire week are noted, and the foundry department also took on some new contracts for castings.

The Cincinnati Chuck Company is running nine-tenths normal and on 10 hr. per day time. It is enjoying a good steady sale of its standard line of independent chucks. Later the company expects to market a line of geared scroll chucks.

The J. M. Robinson Mfg. Company, making a line of tin and metal working machinery, is employing a full force on 55 hr. time and reports conditions quite satisfactory. Corrugating rolls for culvert work have been a leading recent product. Two special jobs were a 10 and a 12 ft. toggle press, weighing respectively about 1200 to 1500 tons each.

The Cincinnati Iron Fence Company reports business improving rapidly in that line, some recent sales including 755 ft. of fence for Sinton Park, in Cincinnati; 685 ft., eighteenth district; 400 ft., Highland public schools; 670 ft., Cynthiana, Ky., Cemetery; 650 ft., Bridgeport, Conn., cemetery; 610 ft., Machias, N. Y., cemetery, and some good orders from Porto Rico for private residences.

It is reported from Zanesville, Ohio, that the American Rolling Mill plant in that city, which has been idle for some time, is now in operation full time, three shifts of 8 hr.

Superintendent F. M. Sherman of the H. E. Talbot Company, Dayton, Ohio, is in Sault Ste. Marie, Mich., arranging preliminary work in the erection of a new blast furnace and merchant mills for the Lake Superior Corporation. It is estimated that the work of making the important additions to the big steel plant will cover a period of from one to one and a half years, and that the expenditure will reach in the neighborhood of \$500,000.

Foremen in the Huntington, W. Va., shops of the American Car & Foundry Company have been sending out calls for all former employees to be ready to report between now and September 1. It is estimated that there will be a force of 2000 men employed in this plant by October.

A new corporation for Lansing, Mich., is the Standard Foundry Company, which is to open for business soon after September 1. The preliminary capital is \$20,000 and the new company will make iron castings, do general jobbing and continue the manufacture of the Hildreth pumps, in the old headquarters of which company it will locate. The incorporators are Joseph Gerson, president; James J. Carey, treasurer, and Jacon Siegrist, vice-president and superintendent. The secretary will be an out of town man and will have charge of the offices. Mr. Siegrist is an officer in the Hildreth Company. President Gerson is secretary-treasurer of the Gerson-Carey Company and is vice-president and treasurer of the A. Simon Iron Company. Mr. Carey is the president of the Gerson-Carey Company.

### Cleveland Machinery Market.

CLEVELAND, OHIO, August 17, 1909.

The volume of business is slowly improving and the market has become fairly steady. Complaints that were made for some time after the revival started that one good week was followed by a poor one are no longer heard. The market has broadened to such an extent that spurts and dull spells are not now in evidence. More activity is noticed in the demand from the automobile manufacturers. While no large inquiries developed during the week from this source, the aggregate of orders for from one to three tools was fairly large. The question of deliveries is becoming more of a factor in the market, and in the case of automobile manufacturers immediate shipment is usually desired. The demand for milling machines, gear cutters, shapers, boring mills and lathes is good, and considerable improvement is noticed in lathe inquiries. About the only line of tools in which scarcely any improvement is noticed in the demand is planers. With stocks cut down considerably by sales during the past few weeks and confident of a good volume of business during the

next few months local dealers are placing good sized stock orders for various lines of machine tools.

Reports from local machine tool and machinery builders are for the most part encouraging. The demand for automatic machines is very good, both from the automobile trade and from other sources. Orders for traveling cranes are not very plentiful, but a fair volume of inquiries has come in and builders look for considerable improvement in business. The demand for locomotive cranes is slowly improving. In heavy coal and ore handling machinery new business is developing slowly, but the outlook is encouraging, as considerable work is in prospect.

The demand for second-hand machine tools is quite active, but the scarcity of good used tools offered to dealers continues, and those placed on the market find ready sale at good prices.

In the foundry trade the demand for light castings continues to improve and foundries are being run from 90 per cent. to full capacity. The demand for heavy castings is picking up slowly. The demand for car forgings has improved materially during the past few weeks.

The second annual outing of the Superintendents' and Foremen's Club of the Cleveland branch of the National Metal Trades Association will be held at Willoughbeach Park, August 21. An interesting programme is being arranged and a large attendance is expected.

The W. H. Mullins Company, sheet metal worker, Salem, Ohio, is contemplating extensive additions to its plant and the installation of considerable additional machinery in its stamping and forming departments. The company reports that it is now crowded with orders in all of its departments. In its boat department it will build 4000 metal rowboats and 1200 metal launches this season. It also has a large amount of orders on hand for automobile bodies and other automobile parts. The company recently made a large shipment of copper windows and doors for a bank building in Honolulu and a shipment of fireproof windows for the Payton Building in Spokane, Wash. It is now at work on a 16-ft. statue of Liberty and four copper eagles, with 9-ft. spread for a Government building in Monterey, Mexico, and a galvanized cornice for a Government building in Chihuahua, Mexico.

It is reported from Toledo that the Federal Creosoting Company will establish a large plant in that city, a site for which has been secured. The company's plans for buildings include a machine shop, 40 x 75 ft.; power house, 60 x 75 ft., and a retort building, 60 x 175 ft.

The John F. Byers Machine Company, Ravenna, Ohio, reports the receipt of orders for 15 hoisting engines in the past two weeks. The company is now quite busy in all of its departments.

The National Motor Supply Company, Cleveland, has been incorporated with a capitalization of \$10,000 to manufacture accessories for automobiles and motor boats, principally vulcanizers and gasoline gauges. The company will establish a small manufacturing plant. V. H. Meyer is the manager.

The Cleveland City Forge & Iron Company, Cleveland, reports a decided improvement in the business outlook. The company is getting a good volume of orders for car forgings and the demand for turn buckles has improved materially.

The Automatic Flushing Machine & Nozzle Company, Cleveland, has been organized to manufacture a street flushing machine, the invention of Superintendent Hanna of the city Street Cleaning Department, who is president of the company. F. W. Cummings is the secretary. The company announces that it will establish a factory at West Nineteenth street and Abbey avenue.

### Philadelphia Machinery Market.

PHILADELPHIA, PA., August 16, 1909.

There appears to be a gradual steady forward movement in the demand for machinery and tools. While individual orders are usually small, a few of a larger size are noted, particularly for delivery outside the immediate territory. The total volume of business is better, and the trade is much encouraged with the outlook. Reports received from manufacturers indicate greater activity in a number of instances; plants which have been operated during the past year or so at a very low percentage are rapidly approaching normal, and delays in delivery of certain classes of tools are reported. Inquiries are more numerous; builders of textile machinery have been in the market quite freely, while automobile manufacturers continue fairly active buyers. The railroads show further indications of being in the market for a fair amount of equipment before a great while; in fact, some few scattered orders for minor tools have already been placed. The more general buying of rolling stock, motive power and other equipment by the railroads, for which the trade has been waiting for a long time, has no doubt begun, and while not

immediately effective, as far as machine tool builders are concerned, is considered extremely favorable as indicating a substantial movement toward more general prosperity. The betterment in the demand has been confined to no particular class of tools; milling machines have probably been the most active, and on some makes and sizes deliveries are much delayed, and in some instances sellers have lost business on that account. Lathes have been in fairly good demand, principally those of the smaller and medium sizes. Punching and shearing machinery, as well as other tools used in connection with steel car construction, have been quite active, and some fairly good orders for equipment of that class have recently been booked by local builders.

The export demand shows a slight improvement; the greater portion of the inquiry is for machinery and tools of a special nature, and the volume of actual orders taken continues rather small. Manufacturers transacting an established business abroad in power transmission specialties report a moderate business which is gaining in volume.

Little change is observed in the second-hand machinery market. The demand continues of a more or less irregular nature, and appears to be confined to no particular class of tools, but is rather general in character. The demand for heavy engines and boilers continues active; that for second-hand boilers is also good, although that for second-hand engines is but fair.

The foundry trade notes a steady gain in the volume of business coming out. Orders develop more freely and the tonnage is better. While the demand for castings coming from the machine tool builders has not been large it shows an improvement. Most steel casting plants as well as gray iron foundries are better employed.

The Baltimore & Ohio Railroad has closed contracts for some 2500 freight cars and 65 passenger coaches, and is still considering the placing of orders for about 2000 cars and a number of locomotives. Local builders are estimating on plans for the same company calling for a toolroom and carpenter shop 28 x 30 ft., a warehouse 16 x 20 ft., scrap bins 16 x 20 x 40 ft., a blacksmith shop 16 x 30 ft., and several smaller buildings.

George R. Stearns, Director of Public Works, Philadelphia, will take bids until August 24 for main sewers, branch sewers, sluice at Mingo Creek Pumping Station and a bridge, specifications regarding which may be obtained at the Office of the Bureau of Surveys, Room 412, City Hall.

The American Die & Tool Company, Reading, Pa., states that it has sufficient orders on its books to keep its full working force busy for the next 12 months. The general outlook for business is much brighter, inquiries are coming in quite readily.

The Hilles & Jones Company, Wilmington, Del., is running its plant on full time with almost its complement of men, and the amount of new work in sight is very promising. The only unfavorable factor is the low prices which prevail for the class of equipment manufactured. Recent notable orders taken include two from Western car builders, one of which is for 15 and one for 18 punching and shearing machines, mostly of the heavier sizes.

The Newton Machine Tool Works, Inc., notes a constantly increasing demand for cold saw cutting-off machines, and the bulk of the business recently received has been for that class of tools. The demand is constantly increasing; a good volume of business is being placed and it is believed that if purchases continue to be made in the same quantities as they have in the past six weeks it will not take long to fill plants up and have tool manufacturers loaded with work and deliveries again much delayed.

The Pennsylvania Shafting Company, Spring City, Pa., has just completed the installation of a large addition to its equipment, comprising a complete turning outfit for the making of large and medium sizes of turned shafting, so that its productive capacity has been increased from 30 to 50 per cent. Since June last this company has noted a steady improvement in the demand for shafting, which now exceeds anything it has had since the panic of 1907.

The Detrick & Harvey Machine Company, Baltimore, Md., started its plant on full time on August 6, although running at a reduced force as compared with that employed two years ago. An improvement in the volume of business taken is reported by this company with an increasing volume of inquiries, which look very much like the placing or orders later on.

The Philadelphia & Reading Railway Company, W. Hunter, chief engineer, will take proposals until September 1, for work appertenant to the abolishment of grade crossings on the Philadelphia, Germantown & Norristown Railroad along Ninth street in this city, as follows: Contract No. 37, signal bridges, Green street to Norris street; contract No. 38, two signal towers, one located at Brown street and one at Jefferson street. Plans and specifications may be had at the office of the engineer, 520 Reading Terminal, upon payment of a deposit to guarantee their return.

**A New Blast Furnace at Youngstown.**—Announcement is made by the Youngstown Sheet & Tube Com-

pany of its intention to build another blast furnace at East Youngstown, Ohio, to be of modern construction, with a capacity of about 500 tons daily. It will be known as Furnace C, A and B having been completed and blown in last year. The new furnace will more than make up the pig iron capacity lost through the sale of the company's Alice Furnace at Sharpsville, Pa., made to the Thomas D. West Foundry Company, which was rated at about 250 tons daily. Possession of the latter will not be given until July 1, 1910.

## Government Purchases.

WASHINGTON, D. C., August 17, 1909.

The Isthmian Canal Commission will receive bids until September 9, Circular No. 531, for an engine lathe, punching and shearing machine, boring and turning mill, hand pumps and other supplies.

Bids will be received until September 9 at the office of the United States Engineer, New Orleans, La., for a combined pile driver and derrick to be installed at Burrwood, South West Pass, Mississippi River.

The Constructing Quartermaster, Fort Sheridan, Ill., will receive bids until September 6 for 10 steam heating boilers for the officers' quarters.

The following bids were opened August 10 for machinery for the navy yards:

Class 11.—One stiff legged derrick—Bidder 7, American Hoist & Derrick Company, St. Paul, Minn., \$854.29; 130, New Jersey Foundry & Machine Company, New York, \$835.

Class 71.—Six pneumatic emery grinding machines—Bidder 35, Chicago Pneumatic Tool Company, Chicago, Ill., \$80; 95, Independent Pneumatic Tool Company, Chicago, Ill., \$80.

Class 72.—Four electrically driven centrifugal machines—Bidder 46, D'Olier Engineering Company, Philadelphia, Pa., \$1700.

Class 84.—Four engine lathes—Bidder 41, Cameron & Barclay Company, Charleston, S. C., \$585.93; 56, Fox Brothers & Co., New York, \$569; 60, Fairbanks Company, New York, \$665 and \$635; 76, Garvin Machine Company, New York, \$563.90 and \$579.90; 79, Hendey Machine Company, Torrington, Conn., \$677; 102, I. H. Johnson, Jr., Company, Philadelphia, Pa., \$605; 110, R. K. Le Blond Machine Tool Company, Cincinnati, Ohio, \$565.20; 124, Manning, Maxwell & Moore, New York, \$765, \$730 and \$625; 126, John B. Morris Foundry Company, Cincinnati, Ohio, \$592.40; 135, Niles-Bement-Pond Company, New York, \$576; 147, Pratt & Whitney Company, Hartford, Conn., \$768; 170, Springfield Machine Tool Company, Springfield, Ohio, \$564.

Class 85.—One engine lathe—Bidder 41, Cameron & Barclay Company, Charleston, S. C., \$853.31; 60, Fairbanks Company, New York, \$841.80 and \$809.85; 76, Garvin Machine Company, New York, \$755.80; 79, Hendey Machine Company, Torrington, Conn., \$941; 102, I. H. Johnson, Jr., Company, Philadelphia, Pa., \$833; 110, R. K. Le Blond Machine Tool Company, Cincinnati, Ohio, \$815.50; 124, Manning, Maxwell & Moore, New York, \$965, \$1235, \$1155 and \$925; 135, Niles-Bement-Pond Company, New York, \$837; 170, Springfield Machine Tool Company, Springfield, Ohio, \$775.

Class 86.—One engine lathe—Bidder 41, Cameron & Barclay Company, Charleston, S. C., \$1248.91; 60, Fairbanks Company, New York, \$1139.75 and \$1197.75; 76, Garvin Machine Company, New York, \$1077.75; 79, Hendey Machine Company, Torrington, Conn., \$1408; 102, I. H. Johnson, Jr., Company, Philadelphia, Pa., \$1239; 110, R. K. Le Blond Machine Tool Company, Cincinnati, Ohio, \$1150.25; 124, Manning, Maxwell & Moore, New York, \$1415, \$1275 and \$1100; 135, Niles-Bement-Pond Company, New York, \$1420 and \$1194.

Class 91.—One gasoline engine—Bidder 67, Gas Engine & Power Company, Morris Heights, N. Y., \$4456; 84, Holsting Machinery Company, New York, \$2180; 128, Murray & Tregurtha Company, South Boston, Mass., \$2750; 166, Sterling Engine Company, Buffalo, N. Y., \$2600; 212, Holmes Motor Company, West Mystic, Conn., \$3250.

The following bids were opened August 3 for six water condensers for the Isthmian Canal Commission:

Griscomb-Spencer Company, New York, \$2400; Sanitary Water Still Company, Brooklyn, N. Y., \$4540.

Under bids opened June 21, Circular No. 514, for machinery for the Isthmian Canal Commission, the Drew Machinery Agency, Manchester, N. H., has been awarded class 1, one surface condenser, \$2520.

Under bids opened August 3 for machinery for the navy yards, the Ferro Machine & Foundry Company, Cleveland, Ohio, has been awarded class 11, gasoline engines, \$858.

Under Circular No. 519A, bids opened June 30, the Mosher Water Tube Boiler Company, New York, has been awarded two submarine water tube boilers for the Isthmian Canal Commission at \$6500.

The Buckeye Rolling Mill Company has been incorporated with a capitalization of \$100,000, to take over the plant of the Ohio Rail Company in Newark, Ohio, which was recently purchased by Steubenville interests. The incorporators are: Edward Thomas, L. L. Grimes, J. T. Sarratt, F. M. Work and E. E. Francy. Citizens of Newark have raised a bonus of \$5000 that was asked to keep the plant in that city, and its proposed removal to Steubenville has been given up. The plant is now being overhauled and it will be placed in operation soon for the manufacture of light rails.



## Trade Publications.

**Industrial Buildings.**—D. C. Newman Collins, consulting engineer and architect, 29 Broadway, New York. Booklet. Shows a number of model industrial plants and illustrating layouts for big plants designed by Mr. Collins. These include the large plant of the Lidgerwood Mfg. Company at Newark, N. J., the locomotive repair shops of the Lehigh Valley Railroad at Sayre, Pa., a plant for the American Portland Cement Company at Alsen, N. Y., and other notable plants.

**Speed Reducing Transmission Gears.**—D. O. James Mfg. Company, Chicago. Catalogue D, 112 pages. Contains much valuable data relative to cut gears and worms. Particular attention is directed to the O K all-gear speed-reducing transmission for reducing speed from a motor or driving shaft to any required of driven shaft. A description of this speed-reducer was published in *The Iron Age* of July 30. The catalogue contains price-lists of iron, steel and rawhide gears of all kinds, also a number of carefully compiled reference tables, including wire gauge and screw thread standards, gear wheel data, pitch diameters of circular pitch gears, &c.

**Gas and Oil Furnaces.**—Chicago Flexible Shaft Company, Chicago. Catalogue No. 33. Describes the company's line of gas or oil burning furnaces. These are designed for use in connection with various processes for hardening high speed and other steel tools. Different forms and sizes of Stewart forges for tool dressing are shown, as are also the Magnet heating furnace, rivet furnace, bench rivet heater and rotary positive pressure blower.

**Rock Drills.**—Ingersoll-Rand Company, 11 Broadway, New York City. Bulletin, Form No. 4001. Shows and describes briefly a number of standard types of rock drills, together with views of the drill departments of the company's plants at Phillipsburg, N. J., and Painted Post, N. Y. Drills for working in different kinds of rock formation are described, and some drill capacity tables are included.

**Universal Shears.**—Covington Machine Company, Covington, Va. Folder. Describes a universal plate bar and angle shear which was illustrated in *The Iron Age*, July 29, 1909.

**Buffing Lathes.**—A. B. Nutting & Co., Amesbury, Mass. Folder. Contains a brief description of the patent duplex independent end buffing and polishing lathe which was illustrated in *The Iron Age*, July 29, 1909.

**Muffle Furnaces.**—W. S. Rockwell Company, 50 Church street, New York. Folder No. 5. Illustrates a muffle furnace for assaying and other work adapted to use oil or gas as fuel, and contains a brief description of it.

**Portland Cement.**—Universal Portland Cement Company, 115 Adams street, Chicago, Ill. Monthly Bulletin No. 63. Shows a number of buildings in course of construction in which Universal Portland cement was used, and contains descriptive and editorial matter.

**Beacon Lights.**—Aktiebolaget Gas Accumulator, Stockholm, Sweden. Pamphlet. Size  $7\frac{1}{4} \times 10\frac{1}{2}$  in.; pages 34. Pertains to the AGA beacon light, which will give a light of any requisite power up to several thousand candlepower when necessary, and of any desired character, acting automatically and uninterruptedly for any desired length of time. The illuminant used in the light is prepared acetylene, which is safely stored in large quantities in steel cylinders. An ingenious sun valve is used in connection with the light which, when influenced by the rays of daylight, extinguishes the light for the day, and starts the flame again when the daylight begins to wane. A description of the AGA beacons, accompanied by sectional drawings and photographs, is given.

**Transmission Machinery.**—Hill Clutch Company, Cleveland, Ohio. Booklet. This is entitled "A B C Engineering," and is the first of a series that the company is issuing, and is devoted to line shaft bearings and the Hill collar oiling bearing in particular. Illustrations of turned steel shafting, pulleys, sheaves, spur gears and pinions, Hill collar oiling bearing, ball and socket adjustable drop hanger, and the Smith type friction clutch pulley are included.

**Portable and Industrial Railroad Equipment.**—Arthur Koppel Company, Machesney Building, Pittsburgh, Pa. Special catalogue No. 405. Deals with railroad equipment for quarries, limestone and cement plants, &c., and illustrates the company's steel rails and portable track, switches, switch points and frogs, turntables, wheels, axles, journal boxes, double side steel dump cars, and miscellaneous cars. Several views of installations of the Koppel products are included.

**High Grade Steel.**—Colonial Steel Company, Keystone Building, Pittsburgh, Pa. Two booklets. One is devoted to disks made from Victor annealed high speed steel and Colonial special tool steel, and gives a list containing the net prices and weights of the disks for the various diameters and lengths or thicknesses. The other booklet pertains to Colonial, Red Star, Anchor and other tool and drill steels, miscellaneous steels, high speed steel cutter blanks, and tool steel disks. Classification tables and price-lists of various steels, together with tables of weights and other valuable information are given.

## Plans for Collecting the Corporation Tax.

WASHINGTON, D. C., August 17, 1909.—As the result of an opinion rendered by the auditor for the Treasury Department it is probable that Congress will be called upon at the next regular session to amend the law relative to the collection of the tax on the net incomes of corporations, authorized by section 38 of the Payne Tariff act. In the meantime, however, preparations will be made to enforce the law.

While the authority for the levying of the corporation tax is contained in the Payne Tariff act, no appropriation was made by that law, and the only fund available for the collection of the tax is a small appropriation of \$100,000 placed in the urgent deficiency bill in the closing hours of the recent special session. This sum is inadequate, and the terms of the deficiency act are such that in the opinion of the auditor the money cannot be used to augment the general appropriations of the Internal Revenue Bureau, but must be applied solely to the salaries and expenses of officials engaged exclusively in the work of collecting the corporation tax. As interpreted by the auditor, this means that the collectors, their deputies and the general office and field force of the bureau cannot be utilized to collect the corporation tax, but a new staff must be organized, the running expenses of which would far exceed the appropriation made by Congress.

To meet this situation the Acting Commissioner of Internal Revenue has recommended to the Secretary of the Treasury that Congress be requested to authorize the use of all unexpended balances of the general appropriations of the bureau to supplement the sum set aside for the collection of the corporation tax, a recommendation that will, no doubt, be complied with in connection with the passage of the first deficiency bill to be enacted at the coming session. This arrangement would bring the collection of the corporation tax into the general category of the duties of the bureau and would obviate the necessity of organizing a special force for the work.

The Secretary of the Treasury has decided to place the collection of the new tax in the hands of the Assessment Division of the Internal Revenue Bureau, and the first step to be taken by the authorities will be to detail an office force to prepare the blanks, instructions, regulations, &c., which will be distributed by collectors of internal revenue to the corporations in their respective districts. This work will be begun in the course of a few weeks in order that the forms may be in the hands of corporations at least a month or so in advance of March 1, the date when the returns must be forwarded to the bureau.

As soon as the returns are received they will be taken up for careful examination, and if found unsatisfactory in any particular will be referred to the special field staff of the bureau, which will make a minute inspection of the books and records of the corporations in question. As soon as possible after the returns are received the bureau will notify the corporations of the assessments made thereon, which will amount to 1 per cent. on all incomes in excess of \$5000 earned during the calendar year 1909, and the law requires all payments to be made on or before June 30, 1910.

W. L. C.

**Pittsburgh Manufacturers Lease New Ore Docks.**—The Jones & Laughlin Steel Company, Republic Iron & Steel Company and Shenango Furnace Company have leased from the Lake Shore & Michigan Southern Railroad the mammoth new ore dock which the latter is now constructing at Ashtabula, Ohio. The new dock is opposite the slip front of the ore dock just completed for the Conneaut Dock Company, and which is said to be the largest along the lakes. The companies that have taken the lease of the new dock, which is to be completed this year, have jointly held the lease on an old dock east of a drawbridge near there, and which is still being used by them. It is the intention of the Lake Shore Railroad, as soon as the new dock is completed, to dismantle the old one and use the space it occupies as storage capacity for coal, which will be handled from that point both from Pittsburgh and the anthracite fields.

# HARDWARE

**T**RITE though the observation may be, it is nevertheless unquestionably true that success in merchandising involves constant watchfulness over and alert attention to the progress of developments in any given line of trade. And this applies with special force to the Hardware business, embracing as it does stocks composed of a vast variety of articles covering a multiplicity of uses. Thousands of improvements, including new devices or new styles of existing lines, are being introduced every year, and the enterprising merchant if he would be abreast of the times in seeking to expand his business and multiply his sources of profit must keep track of these movements. In the shifting changes brought about by new demand resulting from altered conditions such evolution may take place in certain products as will quickly divert distribution through other channels unless the merchant is keenly alive to the situation. The prevalent tendency toward the application of power drives to machines heretofore commonly operated by hand should not be lost sight of, since its innovations directly concern many articles long recognized as properly belonging to the Hardware trade.

A striking illustration of what is being accomplished in this direction is seen in the wonderful expansion of the gas and gasoline engine industry, which is furnishing motors in small units adopted to all sorts of service. Within the last decade motors of these types have been greatly simplified, and instead of being regarded as a more or less uncertain and expensive source of power, little understood except by skilled mechanics, they now command general favor and are being everywhere successfully handled by persons of limited mechanical training and experience. A case in point which specially demonstrates the need of taking cognizance of this development, and of appreciating the possibility it offers to Hardware merchants for the profitable extension of their activities, is the application of the gasoline engine motor drive to Lawn Mowers. These machines are the outgrowth principally of a demand from parks, cemeteries and golf courses, whose areas are too large to be covered by hand or even horsepower machines as economically and speedily as is required. Observing this departure from old time practice, an enterprising Hardware merchant in a Western city, believing that the equipment of a Lawn Mower with motor drive offered no logical excuse for its distribution through new channels, made a vigorous campaign for the sale of power machines, with the result that orders were secured for six at \$1300 each in one season. There is food for thought in this incident, since it not only points the way toward a new avenue for trade expansion but is equally suggestive of others of like nature. The farmer fortified by wealth resulting from years of prosperity is no longer inclined to bend his back over the Grindstone, Saw, Cream Separator or Pump when simple motor power is easily obtainable and cheaply supplied; and these and other appliances in the small shop as well as on the farm are being operated more and more by motors instead of by hand. As in the case of the Lawn Mower, not only the Tools themselves but the driving equipment as well should and may be handled by the wideawake Hardware trade.

## Condition of Trade.

The outlook is gradually assuming definite form in the way of improved conditions, which should gather headway with the approaching close of the vacation period. Some confirmation of this is found in the reported increases in railroad earnings, freight movement, decreases in the number of idle cars, fears among high officials of a car shortage this fall and the increased bank clearings. According to late published statements of the American Railway Association and Chairman Knapp of the Interstate Commerce Commission, the roads are now handling almost as much traffic as they carried in the rush months of 1907, which was a record year. August indications gauged by some price advances, some withdrawals of quotations, the character of orders received from salesmen, as well as customers direct, and which are larger, containing more items and better quantities, all point to the resumption of normal business activity. The orders are said to be well balanced, partaking less of the actual requirement character. It is evident that prices are such that manufacturers in many instances are accepting specifications reluctantly, but nevertheless taking them. Another assuring factor is the manifest cheerfulness and faith in the approach of better times after the long period of liquidation. Buyers are showing a more venturesome spirit in ordering than has obtained since even the spring of 1907. There is also an indication of a change for the better in an increasing volume of commercial paper being handled by bankers to pay for purchases in lines of metal products. An improvement in collections is noted. A representative wholesale house reports a marked increase in sales over the corresponding months of last year and that several months' totals exceed those in any year as far back as 1906. There are experienced buyers for important interests who are ordering freely of staple goods in the belief that, from the nature of things in the raw material and labor markets, advances must be made, and which the excellent crop prospect is accentuating.

### Boston.

**BIGELOW & DOWSE COMPANY.**—Two armies numbering 15,000 men, fully equipped on a war basis, are manoeuvring in the southern part of Massachusetts. The Reds have made a landing at New Bedford and are marching in force to capture Boston. The Blues, comprising our State militia, are in line of battle to check the advance. The artillerymen are on the lookout for trouble, and great searchlights on the forts in the harbor are in active service to prevent the enemy's advance. We were scared a bit when we expected the Spanish fleet, but since that time great improvements have been made in the harbor defense, so that it is practically impossible for an enemy to pass inside the forts.

Since the reorganization of the Boston Chamber of Commerce its membership has increased to about 3000, including merchants, bankers, scholars, lawyers and others representing the best and most progressive men in New England. The organization's work is to encourage and help New England interests. Its first good work resulted in free hides and reduced duties on scrap iron, iron ore and coal. The country will hear from these reductions later.

While there is lots doing in New England, July and August are dull months for the sale of Hardware. Each week a new lot start on their vacations, and each Monday others return brown as berries and filled with new life and vigor for the fall campaign. Each month now



shows a handsome increase in sales over the corresponding month of last year, and several months' sales exceed those in any year as far back as 1906.

There is every reason to believe we are assured a large business this fall. Prices are firm and advances are in order. Many merchants are ordering early and think it about time to change from the hand to mouth buying. Everything looks good.

#### St. Louis.

**NORVELL-SHAPLEIGH HARDWARE COMPANY.**—All the Central West the past week has been enjoying some good old fashioned hot summer weather. It has also been very dry. The Government cotton crop report, as expected, was unfavorable. Conditions in the South are very spotted, some places having had plenty of rain, while others nearby have been suffering from a severe drought. General business, however, is good and continues to show satisfactory increases over last year.

The city of St. Louis has the vacation habit. In the month of August the town is almost deserted by all its notables. Banks and trust companies have a hard time getting quorums. Newspapers fill up their society columns with the doings of hitherto unknown persons. The hard earned money of St. Louis is being spent at the seashore, on the northern lakes and in the mountains. St. Louisans are especially fond of Michigan and every summer the various St. Louis colonies in that State have a busy social time. Then there are Rye Beach, Magnolia, Bar Harbor, Martha's Vineyard and Dublin, where some of our best people spend their vacations and compare notes with their summer friends from other cities. An unusual number of St. Louis people, especially St. Louis women, have gone to Europe this summer. From the seashore, from the lakes, from the mountains, from abroad, we receive colored postal cards with greetings, reminding us of the felicity of our friends and the fact that we are working with the thermometer 98 in the shade.

Well, we reflect, "every dog has his day," but our day does not come in the dog days. Anybody can travel in the summertime, but the real aristocrats take their vacations in the winter. After all, with shower baths, electric fans, automobiles, country clubs and our summer bachelor friends, we who are left behind are not altogether objects of commiseration. Then the summer bachelor in the good old summertime gets out of some of his winter ruts; he makes new friends. And I am quite sure, as far as the creature comforts of life go, we are better served and live better than some of our departed friends who are wrestling with Jersey mosquitoes at Monmouth Beach and elsewhere.

#### Cleveland.

**W. BINGHAM COMPANY.**—It is said that "economy is the road to wealth." Certainly this could apply to our legislators at Washington, for if they would stop their extravagant appropriations the country would be better off and there would be no necessity of agitating the corporation or income tax that we hear so much about. Also with the exercising of business sense and proper economy on the part of our public servants at Washington there would be no such thing as a deficit in the Treasury.

Secretary Knox seems to be the right man in the right place and understands our foreign relations very well, and we believe the \$100,000 appropriation for an active campaign in securing and encouraging foreign trade is in the right direction. If we had more such wise heads to conduct our money appropriations what a blessing it would be for this country.

Though the month of August is usually quite dull, it is reported that the steel mills throughout the country have orders on hand in excess of their production, and the prospects are that the mills of the country will be kept in active operation the rest of the year.

The immense crops that are being gathered throughout the country, and the high prices they are marketed at, are stimulating trade in all branches. The first figures from the Northwest show a great gain in the wheat crop over last year, especially in North and South Dakota and Minnesota.

Is it not about time our Government did something toward encouraging trade with South America? Here is a great market right at our doors, and if we would give only slight encouragement our business with it would grow by leaps and bounds. If a poor country like Peru can give a subsidy to bring its people nearer the United States, is it not about time the United States did something of the kind and give our people an opportunity to grasp this immense South American trade?

The depressed business conditions of the last year, largely brought about by hostility toward the great corporations and transportation companies, have given the people of our country an opportunity to study the situation, and they now realize that instead of bringing condemnation and oppression on us they have turned out really to be benefactors. So if the panic has taught many of us a lesson of high mindedness and common sense, is it not worth all it cost?

The general Hardware business in this section is exceedingly good for this time of year. Well assorted orders are coming to us through our salesmen and by mail, and the orders are larger—that is, more items and bigger quantities—and our customers for the most part are able to meet their bills promptly, and many are discounting them. We are looking for a number of advances in prices, as the cost of material, labor and increased demand for goods will justify them. Take, for instance, Shovels and Scoops. There is a great scarcity of good handle timber throughout the country; steel has advanced and labor cost has not declined, so why should not the manufacturers see fit or be justified in advancing the price of Shovels and Scoops; also Square and Hexagon Nuts and Carriage and Machine Bolts? We believe they are a good purchase for any retailer, and as our jobbers are fairly well supplied at present, would it not be well for our friends to sort up liberally for fall and spring use?

Many manufacturers, on account of the advance in cost of raw material, are obliged to withdraw prices on many goods; especially is this true of goods in the Rubber line. Rubber Lawn Hose that customers may have on hand and are obliged to carry over for next year's sale will be worth more money than at present.

#### New Orleans.

**WOODWARD, WIGHT & Co.**—From what we can learn the business outlook continues to brighten and trade conditions are much improved. The increase in railroad earnings and bank clearings, as well as the prospective car shortages reported, means that there is business somewhere.

We are having an abundance of rain, much more than is necessary for the staple crops, and if it continues it is liable to do some injury to cotton and also to the harvesting of rice. The rice crop requires an abundance of water, but it has had all it needs, and dry weather is essential now to harvest it.

Reports from the cotton country continue poor, and the crop in Louisiana and western Mississippi is going to be disappointing, due to the activity of the boll weevil principally and the heavy rains. But if the price continues where it is those making anything of a crop will have some salvation.

The lumber people are nearly all running on full time and some of them on double time. The demand continued firm for several weeks, but the capacity in this line is now so large that when they all are running full time it takes a good market and good conditions to absorb the output. Something of the heavy production is commencing to show already in a slight easing off of prices, but if general conditions should continue to improve the market price would soon readjust itself.

During the past eight days New Orleans has had a buyers' convention, held under the auspices of the Progressive Union and Merchants' Committee. The merchants paid the fares of the different visiting buyers, if their gross purchases amounted to a certain sum. This brought in some 500 to 600 merchants from Louisiana and Mississippi and a few from Texas and Alabama. A number of entertainments were provided, automobiles

furnished and a banquet, at which some 400 buyers attended, was given at one of our leading restaurants. The plan worked out very nicely. A large lot of orders were placed, and many new friends made by the different jobbers and merchants participating in the convention. It is proposed to make this an annual affair hereafter, as every one seems to be very well pleased with the results.

#### Portland, Oregon.

**FAILING-McCALMAN COMPANY.**—Business conditions continue promising throughout the Northwest territory, with every prospect of not only a continuance, but of even more favorable conditions as the year goes on. Now that the tariff agitation is out of the way we expect to see our producing industries which were specially interested in the changes settle down on a new basis and go ahead with renewed energy. Our crops in general are excellent, especially the more profitable ones. This, with the high prices ruling, will insure a continuance of good business and good collections until the beginning of 1910.

#### Nashville.

**GRAY & DUDLEY HARDWARE COMPANY.**—The Hardware trade in August is decidedly better than in July. The weather has been unusually warm and the vacation period is still on hand, so we can reasonably expect a continued improvement when these things are behind us.

In the last two weeks the weather has been more favorable and there has been some improvement in the condition of crops. We notice from the Government reports that the Southern States have a little the worst of it in the matter of crop prospects, but with the high prices now ruling on farm products we hardly think the agricultural classes have anything serious to complain of.

We don't think we have ever seen more buildings in the course of construction at this season of the year than at the present time. Although business conditions have been unfavorable for a long time, people seem to have confidence in the situation. We can see no reason why we should not have a good fall trade.

#### Louisville.

**BELKNAP HARDWARE & MFG. COMPANY.**—The market shows steadiness and strength. Wall Street is having its innings and the mercantile world always comes in a close second. We have to wait till the investors are eager and prices keep advancing, then the rail mills and bridge builders and tunnel diggers get busy. Then wages are paid out and the wage earner begins to spend his weekly wad, and that works around in a circle once again to the dealers in every community.

In the offices vacation season still prevails, and the officer on deck longs for the coming of September when his associates reappear, when the conventions dwindle and railroad inducements to leave home are withdrawn. Back with the straggling clerks comes the stenographer more and more important each year as the generation of sales managers, buyers, &c., grow up in the belief that she is indispensable to every moment and to every move. The man is left to his devices as an interviewer, a luncheon eater and a signer of documents. The young lady does much of the rest. She is cutting more of a figure on the stage in modern plays. The novelist has laid hold of her so violently as to almost subject him to arrest, and the reporter or topic writer for the daily press looks to her largely for his choicest and most pungent paragraphs and anecdotes.

The writer within the last few weeks has enjoyed the privilege of a jaunt to Yellowstone Park, several days in Seattle at the Exposition and home with sundry stopovers by Victoria, Vancouver and the Canadian Pacific. There is plenty of room for a great population yet to appear, and the scenery up the Fraser River among the Selkirks at Glacier Lake, Louise, Banff, once seen bids us arrange to come again and stay longer next time. What a great country we have and what good neighbors on the north. They take our money without discount; they follow us in cheap postage with no re-

strictions; they are going to feed us if we get hungry; their constabulary sets us an example of efficient maintenance of the law of the land. Hail to our great progressive neighbor, the Dominion of Canada!

#### St. Paul.

**FARWELL, OZMUN, KIRK & Co.**—There has not been much change in conditions in the Northwest in the past two weeks. Crops have been harvesting in southern and ripening in northern territory. Harvesting is now mainly over in South Dakota and southern Minnesota and the grain is in shock. In the territory farther north harvest has begun and will be in full swing up as far as the Canadian line by the time this letter goes to press.

There is one important reservation to this statement that must be made—to wit: The condition of the weather. During the past week the conditions have not been the very best. However, no serious damage has thus far resulted, but favorable weather is now necessary for saving the crops. Fortunately, the weather conditions in the Northwest at this season are generally favorable for harvesting and threshing, and we shall hope for this experience in handling the bountiful crops that are now in sight.

Trade continues active and satisfactory. If the crops, as they now promise, can be realized on fairly, there will be a strong demand for goods and the fall trade will be heavy. Building operations, both in the cities and country, have been large and promise to continue, and the prospects ahead are excellent.

The adjustments necessary to meet the changes in tariff have largely been made, and business will soon stand on a new footing, and will probably push vigorously ahead under the new conditions. The feeling in the Northwest is generally very strong against many of the provisions of the Payne act. This feeling is much stronger among business men on account of the section that fixes a tax on the earnings of corporations. It is a very general feeling among business men that this piece of legislation is unfair and vicious in principle, and that it will prove very unsatisfactory in operation. It is not believed that it will stand the test of experience. Aside from other objections, the fact should condemn it that it compels a corporation to pay the tax entailed, while an individual or a partnership may use an equal or larger amount of capital in a competing business and have equal or larger profits and yet not pay a dollar of such tax. We believe that the sense of fairness among our people will not permit such a measure as this to remain long in force.

It is greatly to be regretted that President Taft stood sponsor from the beginning for this section affecting corporations. Without his help there would have been no such legislation. In his anxiety to show some revision downward the President, we believe, was too willing to consider the revenue feature of this objectionable bill. The claim that such an act is necessary to help to secure publicity with certain corporations is not sustained by evidence nor entitled to consideration.

#### Philadelphia.

**SUPPLEE HARDWARE COMPANY.**—The present business conditions over the entire country are undoubtedly more satisfactory than at any time since the last two months of 1907. There is no doubt that business has revived more quickly in the last depression than in the two previous ones, and our recovery from the last disturbance would doubtless have been even quicker if the matter of the tariff had been settled earlier, as it is likely that the delay in putting it through has kept many factories from making energetic efforts to increase their trade.

We infer from the many orders which they are now receiving that practically all manufacturers are busy. Since the tariff has been signed one manufacturer of this city has had an inquiry for goods amounting to nearly \$50,000 in value for delivery early as possible. Other manufacturers of our city also note the receipt of large orders. During the past eight months there has been a remarkable increase in building in this city, including quite a number of apartment houses.



The proposed improvements of the Pennsylvania Railroad are noteworthy. It is stated that over \$6,000,000 will be expended, most of which will be used west of Pittsburgh, although a considerable amount of money will be used between Pittsburgh and this city. No doubt many other railroads of the United States will make improvements on a similar scale. The increased business done by manufacturers and the enlarged profits of the railroads in the past six months are the contributing influences which justify these expenditures.

The imports for the month of July were far greater than any month since 1907, indicating that a large fall business is anticipated by our stores.

With the very ample crops reported by the Government and the marked increase in the working forces of manufacturers employment has been given to many persons formerly idle. There has been some recent anxiety regarding the cotton crop, but the month of August, it is believed, will materially improve the outlook.

### NOTES ON PRICES.

**Wire Nails.**—The demand continues on a moderate basis, as the large trade is generally provided with stocks purchased at the low prices ruling in the early part of May. It is expected that the fall demand will be of good volume. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads to jobbers.....	\$1.80
Carload lots to retail merchants.....	1.85
Less than carloads to jobbers.....	1.85
Less than carloads to retail merchants.....	1.95

**New York.**—A fair midsummer demand continues for the usual assortment of general sizes, Flooring Nails somewhat leading other kinds. For small lots at store, Wire Nails are held at the base price of \$2 per keg.

**Chicago.**—The contracts taken at the low prices some time ago have been comparatively all cleared up, and the trade has adjusted itself to the new level and has resumed specifications on a normal basis. Inquiries from the Southwest are especially active in anticipation of a car shortage on the Southwestern roads. A larger consumption is looked for during the fall, and on the whole business is very satisfactory. We quote as follows: \$1.98, Chicago, in carloads to jobbers, and \$2.03 in carloads to retailers, with an advance of 5 cents for less than carloads from mills.

**Pittsburgh.**—It is improbable that any further advance in Wire Nails will be made in the near future, as the trade is passing through the dull season for distribution among retailers. There is a fairly large tonnage of \$1.60 Nails still to be delivered, the mills having booked much more at this figure than they did at the advance to \$1.70, while relatively little business has been booked at the \$1.80 price. We quote the market firm at \$1.80, f.o.b. Pittsburgh, in carload lots to jobbers and \$1.85 to retail merchants.

**Cut Nails.**—Business continues in fair volume, made up for the most part of lots covering nearby requirements. A meeting of the Eastern Cut Nail Association is scheduled for August 19. It is understood that some manufacturers are individually holding Nails at an advance over prices asked by other mills. General quotations are on the basis of \$1.75, f.o.b. Pittsburgh, this price sometimes being slightly shaded on desirable orders. Iron Cut Nails are held at an advance of 10 cents per keg over Steel Cut Nails in the Western market, but in the East this differential is not observed.

**New York.**—The demand for Steel Cut Nails continues in about the former volume, and are held at the base price of \$2 per keg in small lots at store.

**Chicago.**—The jobbers are placing larger specifications for Cut Nails, and the market shows a very satisfactory tendency to broaden out in other directions. We quote as follows: In carloads, to jobbers, Steel Cut Nails, \$1.88; Iron Cut Nails, \$2.03.

**Pittsburgh.**—Notices were received on Tuesday of an advance in Cut Nails of 5 cents to \$1.75.

**Barb Wire.**—In the eastern portion of the country the demand is light, while in the West there is more activity in buying. Shipments are being freely made by the mills on unfilled contract orders. The market is firm and quotations are as follows, f.o.b. Pittsburgh:

	Painted.	Gal.
Jobbers, carload lots.....	\$1.80	\$2.10
Retailers, carload lots.....	1.85	2.15
Retailers, less than carload lots.....	1.95	2.25

**Chicago.**—The mills have cleared their books in a very satisfactory manner of the tonnage taken last spring at the reduced prices then in force, but the consumption seems to have taken care of all this, and orders are now coming in freely at the new prices. Dealers throughout the West expect a large trade this fall, as the farmers have harvested large crops for which they have realized good prices. We quote as follows: To jobbers, Chicago, carloads, Painted, \$1.98; Galvanized, \$2.28. To retailers, carloads, Painted, \$2.08; Galvanized, \$2.38; retailers, less than carloads, Painted, \$2.13; Galvanized, \$2.43. Staples, Bright, in carloads, \$1.98; Galvanized \$2.28; carloads, to retailers, 10 cents extra, with an additional 5 cents for less than carloads.

**Pittsburgh.**—The market is comparatively quiet, this being the dull season. Some shipments are still being made on old contracts, placed at lower prices than now ruling. We quote the current market very firm at \$2.10 for Galvanized Barb Wire and \$1.80 for Painted Barb Wire, in carload and larger lots to jobbers, and 5 cents higher to retail merchants, f.o.b. Pittsburgh, subject to usual terms.

**Fence Wire.**—Conditions ruling in the Fence Wire market are similar to those in Barb Wire, some sections of the country sending more business to the mills than others. The market is firm at the following quotations per 100 lb. to jobbers in carload lots as follows, on a basis of \$1.60 for Plain and \$1.90 for Galvanized, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days, the usual price to retailers being 5 cents additional:

Nos.....	0 to 9	10	11	12	12½	13	14	15	16
Annealed.....	\$1.60	1.65	1.70	1.75	1.85	1.95	2.05	2.15	
Galvanized....	1.90	1.95	2.00	2.05	2.15	2.25	2.65	2.75	

**Chicago.**—The manufacturers of Wire Fencing are receiving their full share of the large volume of trade in all agricultural lines, and the Wire mills are getting a good volume of specifications. Good crops and high prices have encouraged the farmers to make improvements, and the movement into consumption is very active and will probably continue so through the fall months. The market is firm at the following quotations: Carloads, to jobbers, \$1.78, base, f.o.b. Chicago.

**Pittsburgh.**—Shipments continue to be made on old contracts, while there is a little business being booked at the new prices, which are strictly adhered to, these being \$1.60 for Plain Wire and \$1.90 for Galvanized, in carload and larger lots, f.o.b. Pittsburgh, subject to usual terms.

**Sheet Zinc.**—An advance of ¼ cent per pound is announced by the manufacturers of Sheet Zinc under date of August 14. The price is thus made \$7.50 per 100 lb., f.o.b. mill, in 600-lb. casks, of the thickness from Nos. 9 to 19, inclusive, and of the widths from 32 to 56 in., inclusive, and of lengths from 72 to 96 in., inclusive. The discounts given in quantities are as follows:

	Cash with order.	Quantity.	Total.
	Per cent.	Per cent.	Per cent.
Carload lots.....	3	5	8
9000-lb. lots.....	3	3	6
6000-lb. lots.....	3	2	5
3000-lb. lots.....	3	1	4
Less than 3000 lb.....	3	0	3

**Window Glass.**—As a result of the adjourned meeting of the representatives of manufacturers and those of the National Window Glass Workers, held last week, it is reported that an advance in the wages of skilled workmen of 8 per cent. over the scale at present in force, was decided upon. This applies to hand operated plants for the blast of 1909 and 1910. The local market continues inactive and without special features. Prices recommended by the Eastern Window Glass Jobbers'

Association, from jobbers' list, October 1, 1903, for territory east of the Alleghany Mountains are as follows: New England States, from jobbers, Single, 90 and 35 per cent., and Double, 90 and 40 per cent.; New York State, Single, 90 and 35 per cent., and Double, 90 and 40 per cent.; New York State, factory shipments, Single, 90 and 45 per cent.; Double, 90 and 50 per cent.; some portions of Pennsylvania are accorded discounts 5 per cent. better than other States; in the Southern States discounts vary from 90 and 25 to 90 and 40 per cent. on Single and from 90 and 30 to 90 and 45 per cent. on Double, from jobbers.

**Carriage Bolts, Machine Bolts, Etc.**—The manufacturers of Carriage and Machine Bolts and related lines announced revised prices, effective August 17, representing an advance of about  $7\frac{1}{2}$  per cent. The following are the revised discounts, which are subject to the usual concessions to jobbers and large buyers:

	Per cent.
Common Carriage Bolts, $\frac{3}{8}$ x 6, smaller and shorter, cut thread	75
Common Carriage Bolts, $\frac{3}{8}$ x 6, smaller and shorter, rolled thread	75 and 5
Common Carriage Bolts, longer or larger than $\frac{3}{8}$ x 6	70
Machine Bolts, $\frac{3}{8}$ x 4, or shorter and smaller, with H. P. or C. P. Plain Nuts, cut thread	75 and 5
Machine Bolts, $\frac{3}{8}$ x 4, or shorter and smaller, rolled thread	75 and 10
Machine Bolts with H. P. or C. P. Plain Nuts, larger or longer than $\frac{3}{8}$ x 4	70 and 5
Machine Bolts, $\frac{3}{8}$ x 4, or shorter and smaller, with C. & T. Nuts	75
Machine Bolts, larger or longer than $\frac{3}{8}$ x 4, with C. & T. Nuts	70
Machine Bolts, up to 6 in. in length, without nuts, 10 per cent. additional discount.	
Machine Bolts, above 6 in. in length, without nuts, 5 per cent. additional discount.	
Machine Bolt Blanks	70 and 5
Bolt Ends, with H. P. or C. P. Plain Nuts	70 and 5
Bolt Ends, with C. and T. Nuts	70
G. P. Coach Screws	75, 10 and 5
Cone Point Lag Screws	75, 10 and 10
Forged Set Screws	65 and 5
Tap Bolts	55

It is stated that manufacturers' prices have been maintained, and that demand is satisfactory.

**Rope.**—The market is referred to as holding steady at regular quotations, and some manufacturers report that demand is continuous and represents a general distribution over the different sections of the country. Others do not see any signs of the quickening in trade, which is usually expected to show itself about the middle of August. The following quotations represent the market for moderate quantities: Pure Manila of the highest grade,  $8\frac{1}{4}$  to  $8\frac{1}{2}$  cents per pound; lower grades of Pure Manila,  $\frac{1}{4}$  to  $\frac{1}{2}$  cent less than the foregoing quotations. Pure Sisal of the highest grade,  $7\frac{1}{2}$  to  $7\frac{3}{4}$  cents per pound, base; Commercial grade,  $6\frac{1}{2}$  cents per pound. Rove Jute Rope,  $\frac{1}{4}$  in. and up, No. 1, is quoted at 5 to  $5\frac{1}{2}$  cents per pound.

**Linseed Oil.**—No improvement has taken place in market conditions, prices being irregular and new business light. Manufacturing consumers are specifying on contracts or covering requirements by ordering small lots. There is comparatively little Oil for sale, and yet the market is anything but firm. Large buyers do not have enough confidence in the future market to place contracts at prices which crushers will accept for October to April delivery. While regular card prices are unchanged, the following prices are reported as obtainable on immediate business, based on Western Raw: Carloads, 53 cents and up; five-barrel lots, 55 to 57 cents per gallon, both according to buyer and seller. Boiled Oil is 1 cent advance per gallon on Raw.

**Spirits Turpentine.**—The market has advanced slightly during the week under more active buying, which has been confined to jobbing lots in this market. The New York market is represented by the following quotations: Oil Barrels,  $53\frac{1}{2}$  to 54 cents; Machine Made Barrels, 54 to  $54\frac{1}{2}$  cents per gallon.

Fred Bintz has lately started in the general Hardware business at Charlotte, Mich.

## Arrangement of Saws in Tool Case.

THE Churchill Hardware Company, Galesburg, Ill., has adopted the plan of arranging Hand Saws and marking them shown in the accompanying illustrations, Fig. 1 reproducing a portion of the tool case. The

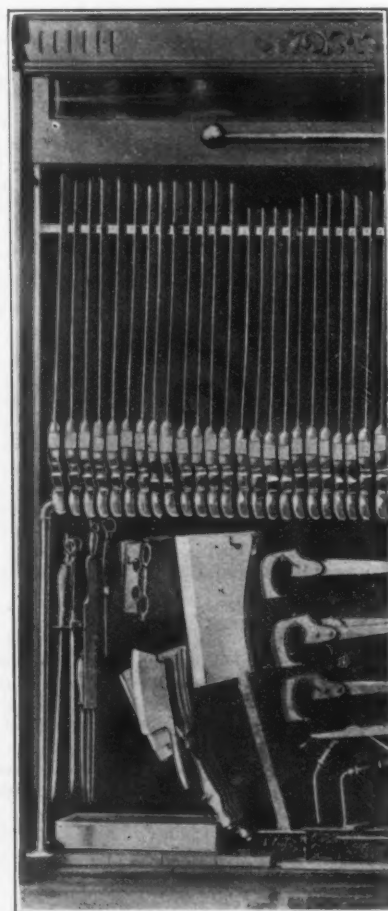


Fig. 1.—Arrangement of Retail Assortment of Saws in Tool Case, with Make of Saw, Number of Points, Cost and Selling Price on Cardboard in Holder on the Handle.

handles of the Saws rest on ordinary  $\frac{3}{4}$ -in. gas pipe, which is extended to the floor at each end of the case. The portion of the pipe upon which the handles rest is covered with garden hose, so that none of the ironwork is exposed and the handles of the Saws cannot become scratched. The tops of the Saws rest in slits sawed in a board to receive them, the tooth side of the Saws being against the back of the case.

On each Saw handle is a tinned copper clip, with the copper side out. It is  $\frac{7}{8}$  in. wide, 1 3-16 in. long and  $\frac{5}{8}$  in. deep. It is cut nearly to a point on the sides, and the ends are turned outward. The top and bottom of the front are turned to hold a card, on which the make of the Saw, its number, number of points and cost and selling price are marked. The price card gives all the necessary details regarding a Saw, and is in such a position that it is readily seen. When a Saw is sold the clip is removed and dropped into a box on the bottom of the case, thus indicating what Saw is to be put in the vacant space. This keeps the assortment complete all the time without going through the stock to check it.

Space is provided for 88 Saws in one row across the case. The company states that this is by far the best arrangement for the accommodation and display of Saws it has ever used.



Fig. 2.—Enlarged View of Copper Price Card Holder on Saw Handle.





This department is open for the discussion of questions which arise in the practical conduct of the Hardware business. Our readers are invited to contribute, submitting inquiries or answering questions.

Correspondents are expected to give their names and addresses, but in order to encourage frank expressions of opinion the advice of our correspondents will be treated in confidence, names and addresses not being published.

For convenience, Questions or Answers should be addressed to THE IRON AGE QUESTION BOX, 14-16 PARK PLACE, NEW YORK.

### Selling Stock to Farmers.

FROM NORTH CAROLINA: I concur in the opinion of your correspondents who favor the selling of small blocks of stock to influential farmers. It appeals to me as being practicable and very desirable. As to incorporating, this is desirable from every point of view. In case of mismanagement you are responsible only for the amount of your stock. You can retire from the business whenever you wish, without affecting the assets, and your stock can be used as collateral for a temporary loan in an emergency. Have never seen nor heard an argument that would prove a "partnership" preferable to a corporation.

FROM ILLINOIS: I do not believe in selling stock to farmers, because they do not understand business principles thoroughly. If 10 per cent. was earned and 6 per cent. dividend declared they would, as a rule, think 4 per cent. too much to carry in the surplus account, and if 4 per cent. was earned on account of competition putting a drain on the profits compared to running expenses, and should it appear that every one was busy at the store, these same farmers would say, "You are hiding things."

Again, in a corporation a shareholder can cause a lot of trouble at times in various ways. We are incorporated, but it is a family affair.

### Form of Lease and Note for Sales on the Installment Plan.

Two or three months since, in reply to an inquiry received from one of our correspondents, we published several forms of lease and note used by merchants in

<p>\$ _____</p> <p>This note is given as collateral security for the rental on a certain lease bearing even date herewith.</p> <p>No. _____</p> <p>Due _____</p>		<p>_____ 19</p> <p>after date, for value received, _____ promise</p> <p>to pay to the order of _____</p> <p>_____ Dollars</p> <p>hereby authorizing any attorney of record to confess judgment for the same, with five per cent. attorney's commission, waiving inquisition, exemption and stay of execution.</p> <p>Payable at _____</p> <p>_____ [SEAL]</p> <p>_____ [SEAL]</p>
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Form of Note Which Is Used in Connection with Lease Above Given.

sales on the installment plan. We reproduce herewith in reduced size forms of lease and note employed by Bard & Cheney, Port Allegany, Pa., which they have found to meet their requirements admirably. Referring to the reasons for getting out these forms the firm writes as follows:

We had two reasons for getting these up. We wanted a lease on some sales so that we could get the goods back if necessary, which could not be done, as we understand it, with the notes, such as Implement companies use, provided the property changes hands. We wanted it so that we could get the money on the notes if necessary.

The note as printed by us is not good unless

### AGREEMENT.

Agreement made between \_\_\_\_\_ 19...  
of the first part, and \_\_\_\_\_  
of the second part: Witnesseth, that the said party of the first part, for and in consideration of the payments and agreements hereinafter expressed, to be paid, kept and done by the said second part, has this day leased and let, and by these presents does lease and let unto the second party, the following personal property of the value of \_\_\_\_\_ Dollars, to wit:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
for and during the term of \_\_\_\_\_ from \_\_\_\_\_ at the rental of \_\_\_\_\_ Dollars per \_\_\_\_\_

In Consideration Whereof, the said party of the second part agrees to pay the said party of the first part, their heirs or assigns, on \_\_\_\_\_ and thereafter, the said \_\_\_\_\_ Dollars, for and during the term of this lease. To keep the property in good condition, not to sublet or underlet the same, to return said property to the party of the first part, their heirs or assigns, at the expiration of the term aforesaid, or other determination of this lease, in good condition, not even damage which may occur by casualties, fire or elements excepted. In case the said second party fails to pay the rental at the time and times when the same shall become due and payable, or fail to perform any of the covenants herein, then first party, their heirs or assigns, shall have the right, and are hereby authorized to retake possession of the said property, wherever found, and the said party of the second part hereby authorizes and empowers any attorney of any court of record, as often as default is made in the payment of the said rental, to appear for the said party of the second part, and confess a judgment or judgments against \_\_\_\_\_ for the whole amount of rent then unpaid, with costs of suit and attorney's commission of ten per cent. for collection, with release of all errors, and waiving all benefits arising from the exemption laws of \_\_\_\_\_ stay of execution and right of appeal.

It is hereby agreed that, in case the said party of the second part shall wish to purchase said property at or before the termination of this lease, then the said party of the first part hereby agrees that upon payment to them of the sum of \$ \_\_\_\_\_ will make and deliver unto the said second part a good and sufficient bill of sale of said property, and will allow all previous payments of rental to apply as part payment.

Witness our hands and seals.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
SEAL.  
SEAL.  
SEAL.

Form of Lease Used by Bard & Cheney, Port Allegany, Pa., in Sales on the Installment Plan.

attached to the lease, so instead of turning over the lease and note to be discounted we make out a duplicate note. It has worked out fine with us during the few months we have used it.

In selling goods on a lease without note the firm advises us that it adds 10 per cent. to the price of the goods, agreeing to deduct this additional amount from last payment in case all payments have been made promptly, a plan which is found to work effectively.

Thinking that other Pennsylvania merchants might like to use the same forms Bard & Cheney have had an extra edition printed, which they offer for sale at the following prices, postage paid, which are, of course, lower than any merchant could get up a supply for his own use:

Leases, per dozen, 35 cents;  
for 50, \$1.25; for 100, \$2;  
Notes, per dozen, 10 cents;  
for 50, 30 cents; for 100, 50 cents.

An enterprising merchant occupying a basement in a frame building on the principal street of a city on the Hudson River, between New York and Albany, recently made use of a clever and inexpensive method of closing out his stock preparatory to locating elsewhere. The business was a modest one, but he displayed part of his stock just inside the sidewalk and with white crayon in a bold, well formed script, announced, "Building to be torn down. Stock and fixtures at cost. Cut prices on everything," on the building front. On the sidewalk similar lettering occurred written at right angles with the walk so as to be easily read by pedestrians moving in either direction.

## Correspondence.

### Checking Up Freight Bills by Retail Merchants.

To the Editor: We have read with interest your editorial of July 29, with reference to the checking up of freight bills by the retail trade.

This in the majority of cases is quite an embarrassing proposition, owing to the complicated detail of the classification, but we have for a number of years simplified this with our trade by taking from the classification the items relating to the Hardware trade and putting them in a table, in shape to be convenient.

The table referred to you will find in the front of the memorandum book, which is mailed you under separate cover.

When the rates are inserted at the top of the page you will readily appreciate the convenience with which any dealer may check up his freight bills and deduct an overcharge.

WRIGHT & WILHELMY COMPANY.

OMAHA, NEB., August 2, 1909.

[Note.—The freight classification as it appears in the Wright & Wilhelmy Company's memorandum book is thus headed: "The rate from Omaha to — is as follows: Class 1, 2, 3, 4, 5," the current rates being filled in under each class. The Hardware classification as prepared by the company is given herewith.]

Ammunition .....	1	ELBOWS—		PURTY—	
Augers, Post Hole .....	2	Bundled .....	1½	Boxed .....	4
Axes .....	2	Boxed .....	1	Cans .....	2
Babbitt Metal .....	3	Fencing Wire, in rolls .....	3	Pulleys, Sash .....	2
Barrows, Wheel, K. D. ....	2	Fencing, Galvanized Field .....	3	RAKES—	
Baskets, nested .....	1½	Forks, Hay and Manure .....	2	Iron and Steel .....	2
Bells, Iron .....	3	FRAMES, SCREEN—		Wood .....	1
Bicycles .....	1½	K. D. ....	3	Refrigerators .....	2
Bins, Flour, crated .....	1½	S. U. ....	2	Registers, boxed or crated .....	3
Blacking, Stove, boxed .....	2	Freezers, Ice Cream .....	1	RIVETS—	
BLOCKS, TACKLE—		Fruit Jars, Glass, boxed .....	3	Iron .....	4
Loose .....	2	GLASS, O. R. B—		Coppered Iron .....	3
Boxed .....	3	Boxes not over 68 united inches		Copper .....	2
BOARDS, STOVE—		outside measure .....	4	Rope .....	3
Boxed .....	3	Larger sizes .....	2 to 1	Rods, Wagon .....	3
Racked .....	2	Globes, Lantern .....	2	Safes .....	3
Bundled .....	1	GREASE, AXLE—		SAWS—	
Boards, Wash .....	2	Boxes .....	4	Boxed .....	2
Bolts, Iron .....	4	Buckets .....	2	On boards .....	1
Bowls, Wood, crated .....	2	GRINDSTONES—		SCYTHES—	
BRUSHES—		O. R. D. ....	4	Boxed .....	2
Bristle, boxed .....	1	Mounted, O. R. B. ....	2	Bundles .....	1
Fiber, boxed .....	2	Mounted, K. D., flat .....	3	Scythe Stones .....	3
Buckets, Well .....	1	Fixtures .....	3	Separators, Cream .....	1
BUTTS—		Guns .....	1	Snaths .....	1
Plain .....	4	Hangers, Barn Door and Rail .....	3	Scales, O. R. ....	2
Japaned or Bro. ....	2	HANDLES—		SCREWS—	
CAGES—		Axe, bundles .....	2	Jack .....	2
Bird, boxed .....	3T1	Axe, boxed .....	4	Scoops .....	2
Nested, boxed .....	1	Fork, bundles .....	1	Spades and Shovels .....	3
CANS—		Hardware, boxed, N. O. S. ....	2	Stove Shovels .....	3
Fruit .....	1	Hammers and Hatchets .....	2	SHELLS—	
Oil, boxed .....	1	HINGES—		Loaded .....	2
Oil, loose .....	1	Strap and T. ....	3	Empty .....	1
Railroad Milk .....	D1	Blind and Gate .....	3	SNOW—	
Carriages, Hay .....	2	Spring .....	2	Boxed .....	2
Carriages, Baby, K. D. ....	1½	Hods, Coal .....	2	Gunnies .....	3
Cartridges .....	2	Hollow Ware, O. R. ....	2	Sieves, Tin .....	1
CASES, SHOW—		Hose, Rubber and Cotton .....	1	Skates .....	2
Boxed, O. R. B., S. U. ....	1½	Huskies, Corn .....	1	Solder .....	3
Boxed, O. R. B., K. D. ....	1 to 1½	IRON—		STAMPED WARE .....	1½
CASTINGS, STOVE—		Bar .....	4	Nested solid .....	3
Bundles .....	2	Corrugated, rel. ....	4	Staples .....	4
Crated .....	3	Plan, O. R., crated .....	4	STOVES—	
Boxes or barrels .....	4	Plan, O. R., roll .....	4	C. R. ....	1½
CHAINS—		Sheet, O. R. ....	4	O. R. ....	3
Boxed .....	4	Irons, Sad, boxed .....	4	Gasoline, O. R. ....	1
Bundles .....	2	Kettles, Sugar, rel. ....	3	Sheet Iron .....	1
Chimneys, Lamp .....	1	LADDERS—		Tacks .....	2
Churns .....	2	Step .....	1	Targets, Clay .....	3
Clocks, boxed, rel. to \$20 each ..	1	Less than 20 ft. ....	1	Ties, Bale .....	4
Cloth, Wire .....	3	Over 20 ft. and up to 30 ft. ....	D1	Tents .....	1
CLOTH, OIL—		Over 30 ft. ....	2½T1	TINWARE .....	1
Boxed or crated, 13 ft. or over ..	1	Lanterns .....	1	Nested .....	2
Boxed or crated, under 13 ft. ....	2	LEAD—		Nested solid .....	3
Carbide .....	3	Bar .....	4	Tin Plate .....	4
CLEAVISES—		White .....	4	TRAPS—	
Boxed .....	3	MACHINES—		Steel, boxed .....	2
Bundled .....	2	Washing, crated .....	1	Fly, boxed .....	1½
CORD, SASH—		Washing, not crated .....	D1	Wire .....	1
Bundles .....	1	Sewing .....	1	TUBS—	
Bales or boxes .....	2	Mills, Coffee .....	2	Galvanized .....	2
CONDUCTOR PIPE, GALVANIZED—		Mowers, Lawn, boxed .....	2	Wood .....	1
Crated .....	1	NAILS .....	4	Velocipedes .....	D1
Bundles .....	D1	Horse .....	3	Wagons, Children's .....	2
Covers, Wagon .....	1	Netting, Galvanized, O. R. ....	3	*Wagon Stock, in white, ironed—	
Combs, Curry, boxed .....	2	Oil, Linseed .....	3	Doubletrees .....	3
COPPER WARE—		OVENS, GASOLINE—		Singletrees .....	3
Nickel Plated .....	1	S. U. ....	D1	N. Yokes .....	3
Plain .....	2	K. D., flat .....	2	WASHERS—	
Bollers .....	1	Pans, Drip .....	3	Clothes, crated .....	1
Coolers, Water .....	1	Pails, Galvanized and Wood .....	2	Clothes, not crated .....	D1
Cutters, Meat or Kraut .....	2	Paint .....	4	Weights, Sash .....	4
Cutlery, not Plated .....	1	Paper, O. R. ....	3	Wrenches .....	2
Dampers .....	3	Picks and Mattocks .....	3	Wringers .....	2
Diggers, Post .....	2	PIPE, STOVE—		Wheels, Well .....	2
Doors, Screen .....	1	Nested solid, crated .....	4	Wire, Barbed and Plain .....	4
EAVE TROUGH, GALVANIZED—		Made up, boxed or crated, rel. ....	1½	Zinc, Casks .....	4
Loose .....	1	Bundles .....	D1	*Ratings apply to common stock, dipped	
Crated .....	2	Planes .....	2	(not painted). Finished goods for bug-	
ENAMELED WARE—		Poles, Fish .....	D1	gles and carriages are 2d and 1st class.	
Nested .....	2	Powder .....	D1		
Nested solid .....	3				

Hardware Items from the Western Freight Classification as Arranged for the Convenience of Its Customers by the Wright & Wilhelmy Company, Omaha, Neb.

FRED P. OLIVER, connected with S. Otis Livingston and the Livingston Nail Company for about 15 years and latterly as secretary and treasurer, resigned his position with the company July 1 and has been appointed sales agent for the Davies & Thomas Company, Catasauqua, Pa., under the general agent, Charles R. Horn, with headquarters at 50 Church street, New York. The company at its foundry and machine works in Catasauqua is a

large producer of cast iron in the form of Columns, Beams, Cast Iron Segments for lining subway and tunnel work, together with cast iron material, varied in character, for contractors and builders.

J. Wesley Stewart, recently of the Stewart-Suydam Hardware Company, Columbia, S. C., has opened a Hardware store in Edgefield, in the same State.



### Increased Water Power for the Goodell Company.

THE Goodell Company, Antrim, N. H., manufacturing Table Cutlery and Hardware Specialties, owing to the severe drought last year determined greatly to increase the volume of its water power. About 4 miles north of the works is a small river, which has a lake for the storage of water at its head, 10 miles long besides other ponds of considerable size below this lake. The large expense necessary for building the dam and especially the penstock, about 1000 ft. long and  $6\frac{1}{2}$  to 7 ft. in diameter, postponed this development several years. The progress on it, however, has been such that the company expects to complete it in about two months. The water wheels are already in position to develop 800 hp. under the 80-ft. head afforded. The dynamo is on the way from the General Electric Company, which will connect directly to the water wheel without any belting. The pole line with three wires of No. 3 copper is erected. Electricity will be conducted over this line at the rate of 6000 volts, and transformed near the works to lower voltage. When the new equipment is in operation there will be added to the present power nearly double that now available, and, it is said, may even treble the present capacity. The dam is concrete and the penstock steel. The

author of the familiar quotation, "the mill never, never grinds with the water that is passed," has been discounted, because at this plant water that has furnished power and gone its way down stream is used over again and sent back in the form of electricity by wire to serve a similar purpose.

### Florida Retail Hardware Convention.

IN connection with the annual meeting of the Florida Retail Hardware Association, W. K. Jackson, secretary, Lakeland, which will be held on October 12, 13 and 14 at Jacksonville, an exhibit of Hardware and kindred goods will be conducted. Exhibitors will have the privilege of displaying their goods for a period of six days from Monday, October 11, to Saturday, October 16. The rate for floor space will be 10 cents per square foot, and not less than 20 ft. nor more than 200 ft. will be given to each exhibitor. Manufacturers and jobbers wishing to make displays may communicate with the Smedley-Rogers Hardware Company, Jacksonville, in regard to the construction of booths. The exhibit hall is a large brick structure comfortably accessible to hotels and railroad depots. Secretary Jackson advises us that every effort is being made to make the coming convention a good live gathering, and a large attendance of Florida merchants is expected.

## THE MICHIGAN RETAIL HARDWARE ASSOCIATION.

### Fifteenth Annual Convention at Saginaw.

Since its organization in 1894 the Michigan Retail Hardware Association has held but four conventions outside of Detroit. On two of these occasions it has been the guest of the city of Saginaw, which on August 11, 12 and 13 entertained the fifteenth annual convention of the organization.

However outclassed by Detroit in point of population, Saginaw possesses a spirit of hospitality and civic enterprise that has won for it recognition in an unusual degree as a favored place for public gatherings. Splendid provision has been made to take care of such meetings by the construction of a municipal coliseum. It was in this splendid structure, centrally located in the heart of the city, within a block or two of the leading hotels—whose erection was made possible by the liberality of Saginaw's public spirited citizens—that all of the sessions of the convention were held and exhibits displayed. The Coliseum contains a main auditorium and stage, with seating capacity of 3400, in addition to which there is a spacious audience hall especially provided with numerous committee rooms.

#### A Fine Attendance.

Michigan is one of the few States whose retail Hardware associations hold their annual conventions during the summer months; but despite the fact that this is generally regarded as a season unfavorable to the holding of an audience of business men indoors for the consideration of routine business connected with such proceedings, no difficulty in this respect has been experienced by the Michigan Association. On the first day of the convention there were about 300 members present in the hall when the meeting was called to order in the afternoon. On the following day this number was largely increased, and the average attendance during the entire meeting has rarely been exceeded in the history of the organization.

#### Programme an Attractive One.

It goes without saying that the attraction and holding of so large a crowd as was here present during a 4-hr. session on a warm afternoon was a crucial test of the loyal interest manifested in the proceedings. Indeed, it was evident that the programmes of each day were so crowded with inviting features touching upon matters of intimate interest to the entire gathering that no further incentive was needed to assure the attendance of members. The programme was enjoyably replete with stirring addresses, valuable papers and lively discussion.

in all of which much instructive information was brought out. None of the speakers scheduled for addresses failed to respond, and no time was found for the consideration of the Question Box.

#### Addresses of Welcome.

The convention was opened on Wednesday by an address of welcome delivered by Mayor C. W. Stewart who,



CHARLES A. IRELAND.



O. H. GALE.

in behalf of the citizens of Saginaw, extended hospitable greeting to the association. He was succeeded by W. S. Linton, president of the Board of Trade, who spoke in a similar vein. After brief responses by President Wright on behalf of the convention and by Frank Conant, speaking for the associate members, the regular work of the session was taken up.

#### Convention Committees.

The following committees were appointed by the president:

AUDITING: Fred Ireland, Belding; Charles Miller, Flint; George A. Frank, Bay City.  
LEGISLATIVE: J. H. Whitney, Merrill; Charles L. Glasgow, Nashville; Paul E. Dunham, Lansing.

BY-LAWS: H. C. Weber, Detroit; F. E. Strong, Battle Creek; J. A. Scott, Lowell.

CREDENTIALS: A. Harshaw, Detroit; Allen Crawford, Springport; U. H. Patrick, Clare.

RESOLUTIONS: Charles A. Ireland, Ionia; G. W. Hubbard, Flint; E. S. Roe, Buchanan.

QUESTION BOX: C. M. Alden, Grand Rapids; C. A. Peck, Berlin, Wis.; J. H. Whitney, Merrill.

NOMINATIONS: O. H. Gale, Albion, chairman; F. M. Brockett, Battle Creek; E. J. Morgan, Cadillac; A. DeWindt, Grand Rapids; O. J. Darling, Detroit; D. H. Onen, Dowagiac; John Popp, Saginaw.

J. H. Temmick, Greenville, acted as sergeant-at-arms.

#### Greetings from the National Hardware Association.

Delegated by the National Hardware Association to present its greetings, R. C. Morley of Morley Bros., Saginaw, addressed the convention on Thursday. In the course of his remarks he observed that while progress was being made in the right direction, the business of merchandising had not yet risen to its proper level, so far as profits were concerned. Considering the grasp of detail involved and the capital required in the Hardware business it should unquestionably receive a substantial measure of reward. This end was, in the opinion of the speaker, being furthered by organized effort through association work which, among other things, is bringing merchants to realize that competitors should not be enemies, but should, on the contrary, maintain friendly relations. This, he asserted, was, is and will continue to be, the attitude of the National Hardware Association toward the retail Hardware merchants of Michigan.

#### Auxiliary Body of Traveling Men.

W. B. Wood, who presided over the meeting during the time allotted on Thursday afternoon to the traveling men, expressed his regret that more of his associates were not present to participate in the proceedings. He suggested the idea of organizing an auxiliary organization of traveling men, and expressed the hope and expectation that before the next convention assembled such a body would be a reality. From the expressions heard during this period, from both dealers and salesmen, the prevalence of the opinion was quite apparent that the mutual interests of both would be well served by closer alliance in an organized capacity.

#### Co-operative Rather Than Mutual Insurance.

In the course of a talk upon Insurance, given by A. T. Stebbins, ex-president of the National Retail Hardware Association, special stress was laid upon the use of the term co-operative instead of mutual as best representative of the Hardware insurance companies. While it is true that these are based upon the principle of mutual support and helpfulness, their plan of operation is best designated as one of co-operation.

In addition to this there is a well defined prejudice existing against so-called mutual insurance as a result of disastrous failures in the past of mismanaged companies mutual in name but not in fact. Since the Hardware companies are not open to such criticism it was deemed wise to avoid as far as possible the misapprehension that is to a greater or less extent created by the use of the term mutual.

#### W. P. Bogardus' Address.

A particularly thoughtful and well considered paper was presented by W. P. Bogardus, Mt. Vernon, Ohio, ex-president of the National Association, who, under the title of "Cui Bono," touched upon several questions of pertinent interest to the trade at large. These were approached from the social as well as business sides, and their relation to association work was ably discussed, as was the influence of the latter upon the withdrawal of standard goods from channels not in harmony with the retail Hardware trade. Mr. Bogardus' address will be given in our next issue.

#### George H. Maxwell on Parcel Post.

So thoroughly has the parcel post question been threshed out in the press and on the rostrum that it is difficult to arouse much enthusiasm upon this topic, however deep and abiding may be the opinions and convictions entertained concerning it. Notwithstanding these conditions the eloquence of an appeal made by George H. Maxwell, Chicago, for the necessity of a determined effort to stem the tide of favor in behalf of such legisla-

tion, was listened to with profound attention. He sounded an especial warning against the entering wedge of the limited system of parcel post now proposed. It is not only, he declared, a question of business, but it is a policy that strikes at the root of the country's civic economy and social life. So rapidly is congestion growing in the great centers of population, with all its attendant evils, that any step aiding in its promotion is a blow at the vital life of the country.

An appeal was made for the broad consideration of this question which the speaker regarded as one closely connected with patriotic sentiments. Opposition to parcel post was based fundamentally upon its centralizing influence and its blighting effect upon the small towns and villages which to-day constitute the bulwarks of the country's prosperity. Reference was made to the helpful work and influence of *The Iron Age* and other trade journals in combating this proposition which if realized would convert the Post Office Department into a freight traffic bureau.

In conclusion, Mr. Maxwell outlined a plan of publicity upon this subject under which, for a dollar a month furnished from each town, he would supply one article each week to be published in the local paper, or two articles a week where there were two papers. Upon a call for a show of hands the project was heartily indorsed.

#### Detroit in 1910.

When the question of selecting a meeting place for the convention of 1910 came up pressing invitations were extended and personally urged by representatives from Saginaw, Grand Rapids and Detroit. Through the persuasiveness of Henry C. Weber, the latter city was chosen, and the next convention will be held in Detroit.

#### New Officers.

By a unanimous adoption of the report of the Nominating Committee, the following officers were elected:

PRESIDENT, Charles A. Ireland, Ionia.

VICE-PRESIDENT, O. H. Gale, Albion.

SECRETARY, A. J. Scott, Marine City.

TREASURER, Wm. Moore, Detroit.

Members of the Executive Committee elected for a two years' term were: Porter A. Wright, Holly; Julius Campbell, Traverse City; Emick Solms, Saginaw; Marshall McKey, South Haven; Fred Rechlin, Bay City.

#### Resolutions Adopted.

In addition to resolutions expressive of thanks for the courtesy of free use of the Auditorium extended by the city of Saginaw through its Mayor and City Council; to the commercial travelers for their co-operation, to the Valley and Bell Telephone companies for free service, and to the various local committees for entertainment, the following resolutions were adopted:

*Whereas*, We believe that a determined effort will be made at the next session of Congress to pass what is known as a parcel post bill; and

*Whereas*, This is believed to be a piece of class legislation and opposed to the best interests of the country at large; believing as we do that such a measure, if allowed to become a law, would largely increase the deficit of the Post Office Department and tend to ruin the smaller towns and cities and centralize business in congested centers, therefore, be it

*Resolved*, That we, the Michigan Retail Hardware Association, most earnestly protest against the passage of such a measure, and request our Senators and Congressmen to use their best endeavors to prevent its passage.

*Whereas*, It would be for the best commercial and business interests of the country to have a universal bill of lading adopted; therefore, be it

*Resolved*, That our National Association use its influence with Congress for the passage of a bill requiring the railroads to adopt a universal bill of lading, showing the classification and rates of all shipments.

*Whereas*, The question of mutual or co-operative insurance is to the best interests of all members of our State associations, saving as it does about 50 per cent. annually in the cost of insurance; and since we believe that a co-operative feature will tend to hold and to increase our State association membership, therefore, be it

*Resolved*, That we recommend to dealers who are members of our association that they extend their influence and patronage to the various co-operative Hardware insurance companies.

A resolution was also adopted heartily endorsing the



plans proposed by George H. Maxwell for opposing the passage of parcel post legislation, and recommending that members lend to him their hearty support.

### Entertainment.

Through the untiring and well directed effort of local dealers, headed by an Executive Committee composed of John Popp, chairman; E. L. Reichle and Charles H. Smith, assisted by capable sub-committees, the members and guests of the convention were delightfully entertained in the intervals of leisure during the hours of adjournment. The duties of providing and supervising the various features of diversion, the expense of which was borne by the State Association, devolved upon an Entertainment Committee, whose kindly office and executive skill contributed in no small measure to the success and enjoyment of the meeting. This committee consisted of V. E. Widenmann, chairman; Theo. Huss, T. A. Saylor, W. H. Tausend, John Popp, H. W. Spindler, and Fred Zahner.

On Tuesday evening tickets were distributed to all in attendance for a trolley ride out to Riverside Park, with admission to the Casino, where a vaudeville performance was staged. Although a drizzling rain interfered with the anticipated pleasure of outdoor recreation in the park, its cooling influence upon the summer temperature made the indoor performance all the more enjoyable. Due attention was given the ladies, who on Wednesday afternoon were treated to a boat ride on the Saginaw River, and in the evening they were entertained by a special organ recital in the auditorium of the Coliseum. Coincident with this performance a lunch combined with vaudeville specialties was tendered to the men at Arbeiter Hall. Plates were laid for about 575 persons, and nearly every seat was filled. Under the inspiring influence of this assemblage several musical numbers were rendered by the orchestra, after which the regular performance of the evening was given.

### Convention Notes.

Thirty-eight new applications for membership were received by the secretary during the convention.

The souvenir programme of the fifteenth annual convention contains what is believed to be the fullest and most complete list of Michigan Hardware dealers ever published. It will be furnished upon application to Secretary A. J. Scott to all jobbers and manufacturers who distribute their goods through retail Hardware channels.

The largest and most varied assortment of goods shown among the Hardware exhibits was that of the local firm of Morley Bros., wholesale Hardware. It occupied the entire foyer and comprised several different displays. This is one of the pioneer concerns in Michigan, having been established in Saginaw in 1863.

For the entertainment of visitors to the trade exhibits, several selections were rendered each morning upon the grand pipe organ installed in the Coliseum.

Much attention was attracted by the remarkable exhibition of shooting by Capt. A. H. Hardy, representative of the Peters Cartridge Company, at a distance of 10 paces; matches held in the hands of volunteer assistants were lit and snuffed out again by rifle shots. Profile drawings of different objects were outlined on cardboard by shots fired in rapid succession. Illustrating the character of powder used, Mr. Hardy stated that on one occasion he had fired 13,066 consecutive shots in a target contest without cleaning his rifle.

The prizes offered to associate members for securing the largest number of new members during the year were won by F. E. Woolley and R. C. Wessels, both of whom were presented with fine leather suitcases.

The following officials of the National Retail Hardware Association attended the convention: Charles H. Williams, president; Geo. W. Hubbard, second vice-pres-

ident; E. T. Stebbins, ex-president and member of the Advisory Board. Representatives from other State associations included F. W. Bartholomew, president, Indiana Association; Grant Porter, president, Illinois Association; Leon D. Nish, secretary, Illinois Association; C. A. Peck, secretary, Wisconsin Association, and W. P. Bogardus of the Ohio Association.

The Lufkin Rule Company, Saginaw, Mich., had a very tastefully arranged and interesting display of Measures, Tapes and Rules. A very neat and useful souvenir was distributed to members of the convention in the form of a small steel pocket Tape Measure. An interesting announcement made by the company is that it has decided to apply the new instantaneous readings to practically all of its steel Tapes without advancing the price.

An instructive talk, which commanded the attention and interest of every person in the audience, was that given on salesmanship by H. N. Tolles of the Sheldon School of Scientific Salesmanship. The basic principles underlying salesmanship were emphasized by means of blackboard illustrations. The keynote of the whole matter was sounded in the statement that the successful merchant must grow and develop, a process that requires patient and careful study and application.

### Trade Exhibits.

This year, for the first time in its history, the association made provisions for and took charge of the merchandise exhibits. The results of its initial efforts in this direction were most gratifying to the organization, as well as to the exhibitors and visitors. In the ample space afforded on the auditorium floor of the Coliseum 89 booths, laid out in uniform order, divided in blocks, with streets and avenues like a miniature city, were erected. Handsomely draped and brilliantly lighted, these sections, with their variegated decorations and displays, made an attractive and pleasing appearance.

To careful attention to all details of arrangement and business-like management exercised by the Executive Committee is chiefly due the exceptional satisfaction and freedom from friction with which this feature of the convention was conducted. During the hours in the afternoon when the convention was in session the exhibition hall was closed, and, whether a coincidence or not, it is nevertheless true that the average attendance at the sessions was better than ever before.

Hitherto the jobbing and manufacturing interests have acted upon their own initiative in securing quarters and space for the exhibition of wares, which were usually shown in hotel rooms. This practice was not without its features of inconvenience and annoyance to all concerned. It is likely, therefore, that at future conventions more attention will be paid to making these displays as attractive as possible. The exhibitors were as follows:

- ACME WHITE LEAD & COLOR WORKS, Detroit, Mich.: Paints and Varnishes. Represented by L. J. Fasquelle, G. C. Burnham, Jr., H. F. Whittaker and Watson Wesley.
- AMERICAN STEEL & WIRE COMPANY, Chicago: American Fence. Represented by W. H. Crawford, J. W. Welch and T. G. Fletcher.
- AMERICAN WEATHER STRIP COMPANY, Grand Rapids, Mich.: American and Gould Combination Weather Strips. Represented by C. N. Willey.
- AUTOMATIC DOOR HANGER COMPANY, Detroit, Mich.: Represented by J. W. McQueen.
- ADAMS & ELTING COMPANY, Chicago: The Original Mission Finish. Represented by R. S. Nichols.
- ATLANTIC STAMPING COMPANY, Rochester, N. Y.: Tinware, Enameled and Galvanized Ware. Represented by W. C. Bancroft.
- AMERICAN CASE & REGISTER COMPANY, Salem, Ohio: American Account Register System. Represented by J. A. Plank, Smith & Son and D. J. McCloud.
- E. C. ATKINS & CO., Indianapolis, Ind.: Saws. Represented by W. L. Sanford, Robert Eveland.
- ASPHALT ROOFING COMPANY, Saginaw, Mich.: Represented by Wm. Tausend, Fred L. Bliss, Chas. H. Morford and C. A. Crippen.
- AUTO-STROP SAFETY RAZOR COMPANY, 345 Fifth avenue, New York City: Represented by J. I. Bernat.
- ALABASTINE COMPANY, Grand Rapids, Mich.: Sanitary Wall Coating. Represented by G. H. Kranenberg, A. A. Gray and G. M. McEachron.
- AJAX DYNAMITE WORKS, Bay City, Mich.: Dynamite. Represented by R. S. Richards, E. L. Mathers and J. P. Thomas.
- BOSTWICK STOVE COMPANY, Lapeer, Mich.: Banner Stoves and Ranges. Represented by J. Frank Laughlin, A. Bostwick and W. Frank Laughlin.

BROWN STAMPING COMPANY, Toledo, Ohio: Oil Cans. Represented by A. L. Baker.

BOYDELL PAINT & COLOR COMPANY, Detroit, Mich.: Represented by J. Frank Boydell, A. Hindmarsh, Wm. Rennie and Joseph Meyers.

BENJAMIN MOORE & Co., Chicago: Muresco Fresco Colors. Represented by W. E. White and Chas. S. Brink.

BOSTWICK-BRAUN COMPANY, Toledo, Ohio: General Hardware. Represented by M. H. Nusbaum, H. S. Ranney, S. W. Johnson, C. P. Louch, W. S. Beebe.

CARBORUNDUM COMPANY, Niagara Falls, N. Y.: Represented by C. G. Emery, K. D. Rose and Geo. N. Allen.

COLDWELL LAWN MOWER COMPANY, Newburgh, N. Y.: Lawn Mowers. Represented by Jno. T. Bullen.

CONTINENTAL COMPANY, Detroit, Mich.: Screen Doors and Window Screens. Represented by R. R. Hart.

R. E. DIETZ COMPANY, New York: Lanterns. Represented by F. E. Green.

DANGLER STOVE COMPANY, Division American Stove Company, Cleveland, Ohio: Gasoline, Oil and Alcohol Stoves. Represented by William J. Best.

E. I. DU PONT DE NEMOURS POWDER COMPANY, Chicago: Explosives. Represented by W. C. McHenry.

DE LAVAL SEPARATOR COMPANY, New York: Represented by C. T. Richards, W. H. Davies, W. E. Graves, H. C. Timmerman and E. L. Mills.

EGHY REGISTER COMPANY, Dayton, Ohio: Sales Registers. Represented by L. A. Ely.

H. S. EARLE MFG. COMPANY, Detroit, Mich.: Represented by Geo. L. Earle.

EMPIRE CREAM SEPARATOR COMPANY, Bloomfield, N. J.: Cream Separators.

J. B. FORD COMPANY, Wyandotte, Mich.: Dairyman's Cleaner and Cleanser. Represented by H. M. Smith and H. C. Smith.

FOSTER-MUNGER COMPANY, Chicago: Sash and Doors. Represented by H. W. Prior, H. F. Wothe and E. J. Matson.

GOSHEN MFG. COMPANY, Goshen, Ind.: Ladders, Lawn Swings, Porch Furniture, &c. Represented by Melvin M. Rager.

W. H. GAUSEWITZ, Saginaw, Mich.: White Cloud Washer.

C. T. HAM MFG. COMPANY, Rochester, N. Y.: Lanterns. Represented by F. E. Smith.

HARDWARE SUPPLY COMPANY, Grand Rapids, Mich.: Hardware Specialties. Represented by C. M. Willey.

HEATH & MILLIGAN MFG. COMPANY, Chicago: Represented by C. T. Patterson and A. G. Barnett.

INTERNATIONAL HARVESTER COMPANY, Detroit, Mich.: Blue Bell and Dairy Maid Cream Separators and Tom Thumb Gasoline Engines. Represented by S. S. Houston, L. A. Brown and D. S. Neill.

IRWIN AUGER BIT COMPANY, Wilmington, Ohio: Bits. Represented by Wm. P. Vrooman.

H. W. JOHNS-MANVILLE COMPANY, Milwaukee, Wis.: J-M Asbestos Roofing. Represented by A. F. Bull and F. L. Postal.

LUFKIN RULE COMPANY, Saginaw, Mich.: Measuring Tapes and Rules. Represented by F. B. McGee, Theo. Huss and Fred Buck.

LOWE BROTHERS COMPANY, Dayton, Ohio: Paints and Varnishes. Represented by J. H. O'Donnell, F. W. Schroeder, T. W. McWhinney and E. L. Schney.

MARTIN-SENOUR COMPANY, Chicago: Senour's Floor Paint. Represented by F. W. Somers and R. E. McComas.

MORLEY BROTHERS, Saginaw, Mich.: Hardware Jobbers. Represented by R. C. Morley, F. A. Taylor, E. L. Reichle, V. E. Weidenman, C. J. Shea and H. A. Spindler.

MOLLER & SCHUMANN COMPANY, Brooklyn, N. Y.: Varnishes. Represented by J. E. Grimes and F. C. Schaefer.

MONROE FOUNDRY & FURNACE COMPANY, Monroe, Mich.: Furnaces and Boilers. Represented by Walter P. Baier.

NORTH WAYNE TOOL COMPANY, Hallowell, Maine: Represented by Geo. L. Earle.

NATIONAL CUTLERY COMPANY, Detroit, Mich.: Represented by C. A. Pennell and D. Gordon.

NATIONAL LEAD COMPANY, New York: Represented by J. H. Wykes, Stephen Bonner and E. A. De Campi.

OHIO VARNISH COMPANY, Cleveland, Ohio: Chl-Namel. Represented by H. H. Adams, T. V. Jones, Miss Silverman and Miss Hungerford.

OHIO TOOL COMPANY, Columbus, Ohio: Mechanics' Tools. Represented by Chas. L. Clark.

PETERS CARTRIDGE COMPANY, Cincinnati, Ohio: Ammunition. Represented by Capt. A. H. Hardy.

PHILADELPHIA LAWN MOWER COMPANY, Philadelphia, Pa.: Philadelphia Lawn Mowers. Represented by B. W. Clark and R. E. Bogardus.

PEERLESS WIRE FENCE COMPANY, Ltd., Adrian, Mich.: Woven Wire Fencing. Represented by H. P. Stearns, C. L. Roeser, A. G. Wilcox and E. M. Roeser.

PORTSMOUTH STOVE & RANGE COMPANY, Portsmouth, Ohio: Represented by Emil Jochen & Son.

POPF & WOLF, Saginaw, Mich.: Peninsular Stoves. Represented by Fred L. Walsh, A. E. Kent, R. W. Ballentine and Hugo Koehler.

H. M. REYNOLDS ROOFING COMPANY, Grand Rapids, Mich.: Torpedo Prepared Roofing. Represented by Jno. B. Wells, W. W. Russell and J. H. Speed.

REVERE RUBBER COMPANY, Boston, Mass.: Rubber Goods. Represented by S. F. Denny and A. F. Wilcox.

SILL STOVE WORKS, Rochester, N. Y.: Sterling Stoves. Represented by H. M. Cass and T. J. Green.

SHERWIN-WILLIAMS COMPANY, Cleveland, Ohio: Paints and Varnishes. Represented by J. M. Benedict and W. N. Cline.

SPEED SALES COMPANY, Grinnell, Iowa: Electric Washer. Represented by H. C. Hardin.

STANDARD SEWING MACHINE COMPANY, Cleveland, Ohio: Represented by S. A. Hart.

STANDARD STAMPING COMPANY, Marysville, Ohio: Natural or Artificial Gas Burners. Represented by R. M. Piper, C. C. Armstrong and D. G. Scott.

SIMMONDS MFG. COMPANY, Chicago: Saws and Files. Represented by T. W. Parker, Jno. O. Brown and Will J. Federy.

STANDARD VARNISH WORKS, Chicago: Represented by J. H. Quigley and W. F. Calvert.

TOLEDO SCREEN COMPANY, Toledo, Ohio: Door and Window Screens. Represented by A. J. Cone and H. L. Haskell.

UNITED STATES REGISTER COMPANY, Ltd., Battle Creek, Mich.: Wall Registers. Represented by Chas. J. Pearson.

UNITED SUPPLY COMPANY, Saginaw, Mich.: Little Giant Paper Presses. Represented by J. A. Marx.

VERMONT FARM MACHINE COMPANY, Bellows Falls, Vt.: Cream Separators. Represented by L. H. Jenns and D. A. Jones.

VICTOR MFG. COMPANY, Leavenworth, Kan.: Wonder Washer and Wringer. Represented by E. V. Allen, H. F. DeWolf and J. M. Topper.

WHITE LILY MFG. COMPANY, Davenport, Iowa: Washing Machines. Represented by A. F. Victor.

## President's Address.

### Educational Value of the Association—Too Much Publicity for Catalogue Houses—Mischievous Price Cutting.

In presenting his annual address, President Wright congratulated the association upon its continued advancement in growth and membership and mutual helpfulness, and spoke with keen appreciation of the loyal support he had received from both active and associate members in furthering the interests of the organization.

Material evidence of its beneficial influences were to be observed, he said, in the improved appearance of the Hardware stores and the more enterprising and intelligent methods of business employed by those who were keeping in close touch with modern developments through the educational advantages offered by the retail Hardware association. Continuing, Mr. Wright spoke in part as follows:

There was a time when it was thought any one could run a Hardware store, but since that time conditions have changed, and to-day the Hardware dealer must be a man of good judgment, and with plenty of experience, as well as some capital. I presume to say that there is no other line of merchandise so complicated and varied as is the Hardware line, with its innumerable lists and puzzling discounts, and it is hard for a good many dealers to arrive at the correct cost of their goods.



PORTER A. WRIGHT.

#### The Catalogue House.

This is a question that has always bothered merchants at large, but I do not think it is as vital a question to the Hardware merchant as to those in other lines, and I am of the opinion that the best way for us to handle it is to let it alone. What I mean by this is not to agitate or discuss the question unduly. It is well, however, to have our customers understand that it is not necessary for them to send their money away for goods which they can always buy as well and cheaply from their home merchants; and I do not know any better way to do this than to keep a large and well selected stock with price on staple lines sufficiently attractive to convince them that they can buy as well or better at home, where they have an opportunity to see and examine goods before they buy them.

I fear that many Hardware men do not lay stress enough upon the fact that we should let our customers know that we appreciate their trade; that we are sufficiently interested in them to let them know that we can supply their wants at all times and to their advantage. Of course, we cannot expect ever to monopolize the business to the exclusion of the catalogue houses, as their field is wide, and, while we expect they will continue to do business, we do want to protect our own interests as fully as possible.

#### Detriment of Cutting Prices.

One of the greatest evils to my mind in any line of business is price cutting. It is a well known fact that no merchant can succeed in business unless he gets a profit on what he has to sell. It matters not whether he is doing a business of \$5000 per year or \$50,000, he must have profits sufficiently large to enable him to pay the running expenses of his store, such as clerk hire, heating, lighting, taxes, insurance, &c., and these vary according to the size of the city or village in which he lives; but in any case he must get a profit.

#### One-Price Motto Would Insure Better Feeling.

Another of the evils which, I believe, is working injury to the Michigan Hardware Association is the jealousy and hatred of dealers in the same towns, as well as in adjoining towns, engendered by this everlasting price cutting; the result is that one dealer makes a cut on a certain article and others are bound to follow, so that instead of helping each other out by being neighborly they are simply stabbing each other in the back. I am glad to say that no such condition exists in my home town. Something I would like



to see adopted by every Hardwareman in Michigan is a "One price" motto, backed up by the practice of selling to everybody at the same price; if that time should ever come there will be no need for a customer to run from place to place to see whose prices are best.

#### Mutual Insurance Economy.

In the matter of insurance every member should be vitally interested; many of us are carrying a large amount of insurance, and every one carries some, so when it is known that we can save from 25 to 50 per cent. of the annual premiums paid for insurance, I cannot see why every member of our association does not avail himself of the opportunity.

## Secretary's Report.

### Association Progress During the Year Has Been Healthy and Encouraging.

The report presented by Secretary A. J. Scott was in the main a recital of continued progress made by the association during the past year. It covered briefly the leading steps taken to promote the growth and welfare of the organization and included a résumé of the results accomplished during the year. The leading features of the report are given in the following extracts:

That the individual retailers are realizing more clearly than they have ever done before that it is to their interest to be associated with the others in their line is evident, and I am glad to be able to report a healthy growth in the membership of our own association during the past year.

#### More Than 700 Members.

At our last convention the secretary's report showed that we had 673 members at that time. During the past year of the above number 16 have either resigned or been dropped for the non-payment of dues, while 43 have gone out of business, leaving 614 of our old members still with us. We have taken in 95 new members during the year, giving us a

present membership of 709, a net gain of 36 members. We have crossed the 700 mark, and you know that means we have got to set a higher mark to shoot at. Shall we make it 800 during the coming year; or is that too easy for us?

I believe that with the increasing interest which is being shown in the subject of Hardware mutual fire insurance, whereby we can offer dealers an actual profit from their membership in dollars and cents, we can add another hundred members to our list within the next 12 months.

#### Activity of Associate Members.

It will be remembered that last year a contest was arranged and prizes offered to our associate members as an incentive for them to get the dealers upon whom they call to join the association. The results which followed this contest were so gratifying that the Executive Committee decided to repeat it, and the fact that we have secured 23 members from this source proves the wisdom of our course. W. A. Kendall of Trade and F. W. Davis have both done excellent work, although not eligible for participation in the contest.

#### Mail Order Buying.

I find that a great many of the hardware dealers follow the policy of refraining at all times from referring to the mail order houses, believing that it is better to appear to ignore them entirely. I have frequently received letters from members of our association stating that catalogue house competition has become of very minor importance in their territory, and I hope that this has been the experience of the majority of those present at this meeting. At the same time I hope that some consideration will be given to this subject during the convention, for there are undoubtedly localities in which the habit of mail order buying is still an important factor.

#### Hardware Exhibits.

It is unnecessary for me to comment upon the fact that Michigan has this year followed the practice in vogue in other States, of taking personal charge of the exhibits in connection with the annual convention. The primary reason for taking this action was to afford the delegates a better opportunity to personally inspect and familiarize themselves with new ideas in merchandising and to conduct the

affair so that it would fit in nicely without interfering with our business sessions.

#### List of Michigan Merchants.

In the souvenir programme sent you prior to the convention appears a list of hardware dealers which I believe is more nearly accurate than any similar list which could be secured from any other source. We believe it is within the province of this association to compile and keep corrected at all times a list of this kind, not only for our own use, but for the use of those jobbers and manufacturers who desire to market their product through the retail hardware man; and I would respectfully suggest that members make it a point to promptly notify the secretary at any time during the year when any changes in business occur or when new firms enter into business, so that a correct list will be available at all times.

#### Grievances of Members.

We have had a few complaints this year, one or two of which I am sorry to say have possibly not been satisfactorily closed; but an effort has been made by the secretary to adjust all legitimate grievances which have been reported, and reference to the complaint file will show that very little difficulty has been experienced in adjusting such grievances in cases where manufacturers or jobbers whose policy is to market their goods through the retail hardware dealer are concerned. I would respectfully remind members that in making a complaint it is essential that the secretary should have all the facts pertaining to the case, so that in writing to jobbers and manufacturers your representative may be thoroughly familiar with the matter which he is trying to adjust.

## The Cash System and Its Merits.

### Experience of a Grand Rapids House Who Abandoned the Credit Basis More Than Two Years Ago.

An address on the "Cash System and Its Merits" was delivered by Henry Stadt of the Stadt Hardware Company, Grand Rapids, Mich., who characterized cash and system as two of the greatest and most needed tools in every merchant's business. In the discussion that followed this address, the advantages of the credit system were stoutly upheld by several speakers, but the impression prevailed that the conditions and circumstances surrounding each individual and locality would always be the dominant factor in the solution of this problem. Mr. Stadt's address is given, in part, as follows:

April 1, 1907, we opened our doors to do a cash business and are doing the same to-day, and always will, and find business better every day. The beginning was somewhat difficult. It was not easy to make people understand that cash meant cash, not 10 or 30 days. We closed our books to everybody, rich or poor, big or small; we treated everybody the same. What a relief! No more hard luck stories of paying rent, doctors' bills, out of work, cut in wages, boys don't work, &c.—nothing of the kind. We find our customers much more free and pleasant and satisfied and we are in the same mood.

#### We Try to Show All Customers

we are doing business in the right and honest way, as our motto is "Cash and one price to all." We show no favor to any one, old friends or strangers, all are treated the same. We tell them we sell good goods at as low prices as possible, and if they want same they must pay the cash. Some who talk back we ask if they do not intend to pay for same. The answer is "Sure." Then why not now—keep your mind clear, owe no one, be a free man, carry no unnecessary burdens in your mind.

#### The Store Policy.

We do not cut our prices. Some days we have "leaders." We strive as much as possible to keep a clean and complete stock and to give our store a welcome appearance. We make prompt deliveries and make right what is wrong at once. If customer is not pleased with what he bought we return his money. We do no newspaper advertising. We have opening weeks April 1 and October 1. Our April opening this year was a big success. We had over 500 women in our place of business that week. Served refreshments, gave souvenirs, sold more household goods that week than in three months. We strive to show what cash will do. During that week we sold 450 yards of Linoleum. Remember this: when people do not owe you they are your friends and are easy to care for. Always remember cash is king in your business. You need it to do business.

#### Contract and Tin Shop Work.

You may want to know how it works in contracting and shop work.

If a contractor orders by 'phone we deliver the goods. If he is not there when the goods arrive we expect him to call at our store in the evening to settle up or send by check the same day or the next morning. If he does not do this we will not sell him again. We handle our shop work in the same manner. Before we take the work we ask the parties if they know our system, and explain same to them. We have no trouble at all. Do we lose trade? Yes, we do, but the loss is so small compared to the trouble of trusting that we gain in the long run.

With churches, schools and corporations we open monthly accounts. We do not consider that credit business and there are no losses on same, as with the transient trade.

## Nails and Tacks.

**How They Should Be Driven in Order to Build Up a Sound, Safe and Successful Business—Bright, Bent, Crooked and Rusty Nails Aptly Compared with Like Qualities in Human Character.**

EXTRACTS FROM A PAPER BY F. N. WITBECK, MILLBURG, MICH.

Nails, so common to most of us, are like people, of many kinds and varieties; some with large and well balanced heads, others, though smaller, have the same faculty of getting to a point; but all will stand driving if properly driven. Some get warped and bend when driven too hard, while others, laying around, get rusty, but they are the foundation of your business, the keystone around which you build your other lines, the base of your commercial life, and for many years have been the prime factor necessary in nearly all buildings. And after the Nails come the Hardware, the housefurnishings.



F. M. WITBECK.

Now you have found in your business career that your Nails become mixed through various causes, and they sometimes get rusty as well, and just to guard against their getting damaged or rusty I shall attempt to put a few Nails of the common varieties before you in the way of comparison, to be used in the foundation of your business, after which I may finish with the Finishing Nail and Tacks.

### More Handshakes and Personality.

My first Nail will be a 60d. personality of yourself in business. Be your own chief gunner and make your clerks able assistants by thorough training. Come in personal touch with all regular customers, meet them with the glad hand whenever and wherever place affords. There is nothing reaches that spot in inner man like a welcome handshake when backed by your personality. "I mean it," a hand that speaks, that tells one you want him to be your friend, and that he is welcome to your place of business whether he makes a purchase or not. Brothers, I'm afraid some of you do not fully realize the power of the "handshake" in business, when put in the right spirit, and not always for gain. As a commercial traveler for several years, when calling on a new merchant, I long ago learned to read him by his handshake and the look of his eyes while so doing.

### Personal Calls.

Another Nail I would drive here is to make more personal calls among your country customers (and I believe most of you have several of this class of customers); take a few hours off once in a while and drive through the country among your friends, dine with them when opportunity affords, and I believe you will see your visits returned with an increase of business from that quarter.

### Cultivate the Children.

The next Nail is to make friends of the children. As busy merchants some of you perhaps think you have no time to spend with them, but take time, and when a child comes into your store, possibly sent there for some trifle, see that he gets prompt and careful attention; use him so kindly that he will want to come back again. Make the child your friend and you will have made a standing advertisement for your place. Brother merchants, do you stop to consider that by kindness to her children, you have reached some mother's heart; you have won a customer in her and through her the father? Try this experiment and see the results.

### Competitors.

The next size I would use would be to size up my brother competitor and make friends with him if possible. I would realize that he was in business the same as I, not as a cutthroat or an outlaw, as some dealers almost confess of their competitors, but a man just like myself, a man who is trying to make an honest dollar, just like myself, to feed and clothe his dear ones. Do this and you see him in a new light; he is a mighty good fellow, just like yourself, when you get acquainted with him.

Do this and your competitor will take a different course: antagonism will disappear, and when a customer happens to mention the name of your rival in trade you will say, "Yes, John sells a good Stove, but I believe I can show you more value in this one," and many times you will have made a sale to a party who might have been a regular customer of the other fellow. Be neighborly, be friendly to your competitors and you are but driving the Nails more firmly in your own foundation.

### Loyalty to Manufacturers and Jobbers.

The next plank which I wish to impress upon you the necessity of nailing down well is loyalty to jobbers and manufacturers who supply you goods. They are your friends. They want you to succeed and prosper, knowing full well that the better merchant you are the better the account, and by helping you they are but driving the Nails into their own foundation more securely with increased sales. Now when you send them a rush order and when the goods arrive something is wrong, or there is a part of it short, which may be annoying to you, do not jump on them with both feet as if the fault was all theirs. There may have been something wrong with your instructions to them; possibly the fault may, in part, lay with you, as I have never seen either a manufacturer or jobber that was not more willing to rectify mistakes than the majority of us with our own customers when given a chance.

Then again, when checking up our goods, are we as careful to report any surplus goods that might have got in by mistake, as we are to go after them for shortages? I'm afraid the latter is sometimes overlooked, for to err is quite human, and I am frank in saying that I do not believe there are many of our members who would overlook such matters; but I do find once in a while a man selling Hardware who would not bother to report such trifles.

As a representative of some very large concerns, I have known of some very unjust claims to be put in by certain dealers for goods short and for breakages, to their manufacturers, but on tracing the matter up have found that they were entirely innocent of any wrong in the shipment, and that the fault was either with the railroad who received the shipment or some of the lines over which it was carried, and sometimes with the dealer himself, and that the redress lay with the transportation company to whom the goods were receipted for in apparently good order.

Then again there are several of our leading manufacturers and jobbers who will not sell to any but legitimate dealers, who have cut out supplying the catalogue houses with their surplus goods. These are the ones we should give our most hearty support.

### Advertising the Store.

As we are now getting down to smaller sized Nails, where less pounds and more numbers are needed for our structure, I will use advertising. How do you advertise? And do you get satisfactory results from same? If not, why not? I cannot tell you how to advertise, as there are many ways, but I can tell you where thousands of your good dollars are wasted in advertising. It is because you try to cover too much surface with one application, or you put an "ad" in a newspaper and let it run for weeks without change. Others try to cover too many lines at one time, and still others will put in a very lengthy article, which, when read by the public, has said nothing.

Now it has been demonstrated beyond a doubt that all merchants are not good "ad." writers. But all can write good "ads" that will get business, if you will give this end a little careful thought and study, so that when your "ad" is published you will have made it so effective that all readers will feel like putting on their outer garments and coming right down to your store to make a purchase. This is one kind of advertising that pays, and here let me give you a rule to go by: Specialize your business more.

Advertise one thing that has merit at a time and word its description so plainly and completely that it will set people to thinking and create an appetite. The object of judicious advertising is not so much to hold your regular customers as to reach out and draw new ones away from the other fellow into your store, and when you get them there your personality and that of your clerks should have the power to make them feel at home, and show up other new goods that possibly they had not seen at their regular merchants. Here is where you use the Clinch Nail and clinch them so strong that they will stay with you.

### The Habit of Cutting on Nails.

So many merchants have had the habit of cutting on Nails as a lever to secure other business that I could not refrain from putting a few Tacks in the subject. Why



should we continue to sell Nails and Wire, two of the standard articles of our business, on a basis that, were our entire annual sales on the same margin of profit as on these goods, we would soon be out of business, or find our working capital fast leaking away in the cost of selling. May I ask if you have ever considered this matter in the light it ought to be, and why should we not add a regular per cent. profit on both the same as other goods, making all stand their share of selling expense, and all standard goods based on the same margin of profit?

#### Pushing Specialties.

The next Nail I will drive is on specialties. We all know that some dealers have made a success in pushing specialties, while others who have taken hold of the same articles have fallen down, and when the salesman who sold him the goods calls on his next trip he is met with: "We can't sell those goods here; they are too high priced," or "We have had no calls for them," &c. The salesman, on investigation, finds the goods packed away, sometimes in the original package. Is it then any wonder that the goods were not sold? That they were too high in price and that they were not called for? With the goods was a large bundle of samples or advertising or both, and everything necessary to help the merchant create a demand for the goods. These cost the maker money, and had they been rightly distributed all would have reaped a benefit.

If you are a progressive merchant and a salesman buy specialties. If not, buy Nails. They are always in demand, if you make the price.

#### Buying and Selling.

And then let me call attention to the merchant who is always calling for a cheap price. It is one thing to buy cheap and quite another to buy right, and the same in selling. Too many merchants who are given a cheap buying are also shouting: "We sell cheap! We make the lowest price in town!" Why not say: "The place where you get the quality," and establish that quality in your customers' minds, and when you have done so you will not have any trouble to get a reasonable price. And when sold you have made a satisfied customer, who will be a standing advertisement for your store.

Get out these hidden away specialties, talk up and show their merit, give out those costly folders sent you, put the price low enough to reward you, and you will soon create that demand that did not exist, because the public did not know such goods were made or that you had them.

#### Association Duties.

My next size will be Mixed Nails and Rusty Nails—our association and the duty of members. I find in going about the State that a majority of our best Hardware merchants are members, but many are not, and the ones who are not are the ones who could be the most benefited by their presence here. And why is this? We have spent hundreds of dollars to tell them the advantage of our association, and all the leading trade journals have lauded the justice of our cause. Salesmen have tried to get them interested, and why are they not here?

Is it because Brother Scott has not done his work well? No! Is it because Brother Wright has not done his duty? Is it because you were so enthusiastic over the coming convention that you forgot to invite them? No! Is it because when you pay your \$4 and come here once a year to elect your officers, you think you have done all you ought? No! But it is because you do not turn in and assist those officers personally to secure those whom we need here; because you expect your officers to do it all, and this is impossible for them to do without co-operation from you; without your doing your part, so that all may enjoy the benefits of this, one of the best trade organizations in our land, to assist us in business and bring us in more dollars.

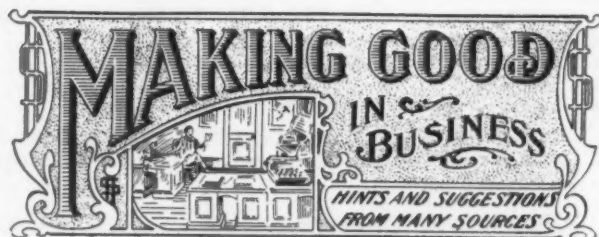
I do not wish to be personal, but I do say that if each one of us would take it upon himself to go personally to some dealer in his vicinity and in an intelligent manner lay this matter before him, pointing out what we are doing, the benefit of our mutual insurance, what his dividend will be in cash, how we are fast severing the bonds of antagonism and strife, and in its place weaving a band of brotherly love, we would then see what co-operation means.

#### County Clubs.

Brothers, let us do our duty as members to our officers and ourselves and get those now not with us into our fold. Let us increase our working capital by the addition of 500 new members next year. This can be done by county auxiliaries or clubs, with a county representative in each county, who will look after all dealers in his county, arrange for a meeting at some central point, then get together, talk over local conditions and regulate them, as the more often a dealer can be brought face to face with his competitor the better. At this meeting arrange credit lists, collection department for poor debts, an information bureau, and other matters that will prove a mutual benefit, and so co-operate with your State organization.

#### CONTENTS.

	PAGE.
Watson-Stillman Hydraulic Shears. Illustrated.....	535
The British Foundrymen's Association.....	537
The Erie City Vertical Water Tube Boiler. Illustrated....	538
British Iron and Steel Exports in 1909.....	540
A Rockford Heavy Duty Planer. Illustrated.....	541
The Refined Iron & Steel Company's Plant to Be Sold.....	541
A Jeffrey Storage Battery Car. Illustrated.....	541
The Electric Refining of Steel.....	542
A New Double Acting Press. Illustrated.....	545
Electric Smelting in Sweden.....	545
The American Boiler Manufacturers' Association.....	546
Indiana's Coke Production in 1908.....	552
A Conveyor Bridge for Loading Vessels. Illustrated.....	552
Metal Trades Working Exhibits at Seattle.....	552
The Anderson Pressure Reducing Valve. Illustrated.....	553
The Use of Charcoal in Melting Brass.....	553
An Improved Ball-Bearing Universal Joint. Illustrated....	554
Judicial Decisions of Interest to Manufacturers.....	555
Editorial:	
New Iron and Steel Making Capacity.....	556
Reciprocity with Hydraulic Power Plants.....	557
Self-Help in Fighting Tuberculosis.....	557
The Constant Comparison of Cost.....	558
Correspondence.....	558
The Production of Coal in 1908.....	559
The Aluminum Castings Company.....	559
The Bureau of Standards to Supervise Steel Rail Tests....	560
Shipbuilding Plant for Port Arthur, Canada.....	560
The Production of Manganese and Manganiferous Ores in 1908.....	561
Advocating an Export Duty on Newfoundland Iron Ore....	561
Personal.....	562
A Modern Steel Roll Foundry.....	562
Obituary.....	562
The Production of Fluorspar in 1908.....	563
Boiler Inspection Departments Organize.....	563
Customs Decisions.....	563
Correction.....	563
News of the Works:	
Iron and Steel.....	564
General Machinery.....	564
Bridges and Buildings.....	564
Foundries.....	564
Power Plant Equipment.....	564
Fires.....	565
Hardware.....	565
Miscellaneous.....	565
The National Enameling & Stamping Company.....	565
A New Structural Tube Plant.....	565
The Iron and Metal Trades:	
A Comparison of Prices.....	566
Prices of Finished Iron and Steel, f.o.b. Pittsburgh....	566
Chicago.....	567
Pittsburgh.....	568
Birmingham.....	570
San Francisco.....	570
Philadelphia.....	571
St. Louis.....	572
Buffalo.....	572
Cleveland.....	573
Cincinnati.....	574
New York.....	574
Iron and Industrial Stocks.....	575
Metal Market.....	576
The Youngstown Foundry & Machine Company.....	576
The Colburn Machine Tool Company's Chicago Representation.....	576
The Public Supply of Electric Power in Great Britain....	577
The British Iron Trade.....	577
An Automobile Company's Expansion.....	577
The Machinery Trade:	
New York Machinery Market.....	578
Chicago Machinery Market.....	578
Milwaukee Machinery Market.....	579
Cincinnati Machinery Market.....	579
Cleveland Machinery Market.....	580
Philadelphia Machinery Market.....	580
Government Purchases.....	581
A New Blast Furnace at Youngstown.....	581
Trade Publications.....	582
Plans for Collecting the Corporation Tax.....	582
Pittsburgh Manufacturers Lease New Ore Docks.....	582
Hardware:	
Condition of Trade.....	583
Notes on Prices.....	586
Arrangement of Saws in Tool Case. Illustrated.....	587
The Question Box.....	588
Correspondence.....	589
Increased Water Power for the Goodell Company.....	590
Florida Retail Hardware Convention.....	590
The Michigan Retail Hardware Association. Portraits..	590
Making Good in Business.....	597
Price-Lists, Circulars, &c.....	598
Among the Hardware Trade.....	598
Requests for Catalogues, &c.....	598
The Pittsburgh Ventilating Sash Lock. Illustrated....	598
The Nasco Extension Truss Bridge Roller Skates. Illus.	598
Yale Bileentric Pin Tumbler Padlock. Illustrated.....	599
Pinion Wire.....	599
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Imitation Osborne Drill Heads.....	600
The Cuero Pure Water Cooler and Filter. Illustrated..	600
The Peerless Enameled Tea Kettle. Illustrated.....	601
Current Hardware Prices.....	602



### Application.

Like the star that shines afar  
Without haste and without rest,  
Let each man wheel with steady sway  
Around the task that rules the day,  
And do his best. —Goethe.

### Opportunity.

The weakness of many is not in a lack of general intelligence, but because they have not come to a realization of the fact that a tree cannot be felled with a few strokes, no matter how sharp the axe. To concentrate the efforts and the energies on one thing, in one place and to keep up an attack on that place is always necessary. The man who flits about from one thing to another, taking a try at this and that, but sticking at nothing long enough to master it, is quite as poor a spectacle as the man who would go into the forest to fell a tree and should hack away at one for a while, get discouraged and turn to another. The second like the first being found to be tough and difficult and the surroundings unfavorable, he gives that up and goes on to a third, and so continues until daylight fades. The consequence is the time has been wasted and nothing of any importance accomplished.

This is just what lots of old men have done all their lives, just what lots of middle-aged men are doing now, and just what lots of young men are starting to do. They are in the virgin forest of opportunity wasting their time nicking trees. The combined blows, scattered promiscuously, would bring down the monarch of the forest, but distributed the blows amount to nothing. Some have never learned that it is absolutely necessary to rain all the blows in one place. A brave start is made to-day and a miserable retreat is seen to-morrow, next week or next month. The effort which one puts forth in the beginning will, if persisted in, bring down the tree. Get in a good nick every day, but, good or bad, get one in. See that to-day's effort follows up that of yesterday. Keep at it and the hoped for condition can no more evade the worker than the tree can stand erect when the trunk shall have been severed at the base.—James E. Clark.

### Service.

Perhaps the most important thing which any merchant sells is that for which he does not make a direct or open charge. The name of this commodity is *service*. Nothing on his shelves or counters is of greater value, and the quality of service which he gives his customers is just as vital to his success, perhaps more so, than is the quality of the goods which he sends out in his delivery wagon or puts into the hands of his customers. On the other hand, service is just as tangible a commodity as sugar or dress goods, and should be as carefully reckoned in his cost account as his bills for goods or his freight or insurance expense.

It is not too much to say that good service is the most profitable thing which the merchant can sell, and that poor service is, by the same token, the most unprofitable thing that he can have about his store. Comparatively

few storekeepers have any realization of this, and seem to conduct their business upon the supposition that service is an intangible quantity, and that the cheaper they can get their clerk hire the better. Few mistakes can be more fatal to merchandizing than this notion.

#### A Fatal Mistake.

From the delivery boy up to the proprietor, quality of service should be considered the very essence of good merchandizing. It is a fundamental trait of human nature to consider the manner in which a transaction is done to be quite as important as the more material part of it. When the storekeeper gets into the city he likes to get his meals at a first-class restaurant. Why? Not because the food served to him is really any better than he would get at a cheaper restaurant, but because the *service* is better. In other words, he is entirely willing to pay for a superior article of attention and for more attractive surroundings. If he is observant and thoughtful he will at once realize that his customers are made of the same clay as himself, and that they will, consciously or unconsciously, take the matter of service into the same consideration in buying goods as he does in buying his meals. They will, as he does, put a premium upon attention, attractiveness of surroundings and promptness and reliability of delivery, not to speak of an agreeable manner in those who render the service.—H. N. Higinbotham.

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There are no snaps in the business world. Any time that you have spent in looking for one is so much wasted out of the limited supply available for making success.

If you want to become a trusted employee, one whom the boss will depend upon, you will have to do more than avoid evil; you will have to avoid the appearance of evil.

To the man whose ambition is backed by cool determination, obstacles are only the stepping stones to success.

Read much and carefully; think deeply; and don't hesitate to make use of the ideas that other men have advanced.

If the boss wants a certain line of goods pushed, push them even if it is a little more trouble. Your chief value to the house lies in your ability to help it make money.

The fact that duty should come before pleasure doesn't mean that it is to take the place of pleasure. You need recreation as much as you need food. Take it regularly and in the open air.

If you are going to be the independent sort that slams the goods down with a take-it-or-leave-it air, you might just as well begin looking for another job right now.

The clerk who objects to doing a thing because "I wasn't hired to do that," is a clerk who will not be very likely to be promoted to manager this year.

The customer is the guest of the store. If you were properly brought up you know how a guest ought to be treated. Do you treat the people who come in as if you personally wanted them to come again?

If you are naturally tasty about arranging goods, cultivate the faculty. Get the privilege of dressing the windows and study the art until it becomes a second nature to get up attractive displays.—*The Clerk's Book*.

With an authorized capital of \$50,000, of which \$16,200 is paid up, the Wendell Hardware Company, Ltd., Wendell, Idaho, has been incorporated to deal in Shelf and Heavy Hardware, Stoves, Kitchen Furniture, Harness, Wagons, &c. The company is erecting a new-store building which will cost about \$10,000. The officers of the company are as follows: C. A. Miller, president; Robert P. Smith, vice-president; George P. Smith, secretary and treasurer and general manager.



should we continue to sell Nails and Wire, two of the standard articles of our business, on a basis that, were our entire annual sales on the same margin of profit as on these goods, we would soon be out of business, or find our working capital fast leaking away in the cost of selling. May I ask if you have ever considered this matter in the light it ought to be, and why should we not add a regular per cent. profit on both the same as other goods, making all stand their share of selling expense, and all standard goods based on the same margin of profit?

#### Pushing Specialties.

The next Nail I will drive is on specialties. We all know that some dealers have made a success in pushing specialties, while others who have taken hold of the same articles have fallen down, and when the salesman who sold him the goods calls on his next trip he is met with: "We can't sell those goods here; they are too high priced," or "We have had no calls for them," &c. The salesman, on investigation, finds the goods packed away, sometimes in the original package. Is it then any wonder that the goods were not sold? That they were too high in price and that they were not called for? With the goods was a large bundle of samples or advertising or both, and everything necessary to help the merchant create a demand for the goods. These cost the maker money, and had they been rightly distributed all would have reaped a benefit.

If you are a progressive merchant and a salesman buy specialties. If not, buy Nails. They are always in demand, if you make the price.

#### Buying and Selling.

And then let me call attention to the merchant who is always calling for a cheap price. It is one thing to buy cheap and quite another to buy right, and the same in selling. Too many merchants who are given a cheap buying are also shouting: "We sell cheap! We make the lowest price in town!" Why not say: "The place where you get the quality," and establish that quality in your customers' minds, and when you have done so you will not have any trouble to get a reasonable price. And when sold you have made a satisfied customer, who will be a standing advertisement for your store.

Get out these hidden away specialties, talk up and show their merit, give out those costly folders sent you, put the price low enough to reward you, and you will soon create that demand that did not exist, because the public did not know such goods were made or that you had them.

#### Association Duties.

My next size will be Mixed Nails and Rusty Nails—our association and the duty of members. I find in going about the State that a majority of our best Hardware merchants are members, but many are not, and the ones who are not are the ones who could be the most benefited by their presence here. And why is this? We have spent hundreds of dollars to tell them the advantage of our association, and all the leading trade journals have lauded the justice of our cause. Salesmen have tried to get them interested, and why are they not here?

Is it because Brother Scott has not done his work well? No! Is it because Brother Wright has not done his duty? Is it because you were so enthusiastic over the coming convention that you forgot to invite them? No! Is it because when you pay your \$4 and come here once a year to elect your officers, you think you have done all you ought? No! But it is because you do not turn in and assist those officers personally to secure those whom we need here; because you expect your officers to do it all, and this is impossible for them to do without co-operation from you; without your doing your part, so that all may enjoy the benefits of this, one of the best trade organizations in our land, to assist us in business and bring us in more dollars.

I do not wish to be personal, but I do say that if each one of us would take it upon himself to go personally to some dealer in his vicinity and in an intelligent manner lay this matter before him, pointing out what we are doing, the benefit of our mutual insurance, what his dividend will be in cash, how we are fast severing the bonds of antagonism and strife, and in its place weaving a band of brotherly love, we would then see what co-operation means.

#### County Clubs.

Brothers, let us do our duty as members to our officers and ourselves and get those now not with us into our fold. Let us increase our working capital by the addition of 500 new members next year. This can be done by county auxiliaries or clubs, with a county representative in each county, who will look after all dealers in his county, arrange for a meeting at some central point, then get together, talk over local conditions and regulate them, as the more often a dealer can be brought face to face with his competitor the better. At this meeting arrange credit lists, collection department for poor debts, an information bureau, and other matters that will prove a mutual benefit, and so co-operate with your State organization.

#### CONTENTS.

	PAGE.
Watson-Stillman Hydraulic Shears. Illustrated.....	535
The British Foundrymen's Association.....	537
The Erie City Vertical Water Tube Boiler. Illustrated....	538
British Iron and Steel Exports in 1909.....	540
A Rockford Heavy Duty Planer. Illustrated.....	541
The Refined Iron & Steel Company's Plant to Be Sold.....	541
A Jeffrey Storage Battery Car. Illustrated.....	541
The Electric Refining of Steel.....	542
A New Double Acting Press. Illustrated.....	545
Electric Smelting in Sweden.....	545
The American Boiler Manufacturers' Association.....	546
Indiana's Coke Production in 1908.....	552
A Conveyor Bridge for Loading Vessels. Illustrated.....	552
Metal Trades Working Exhibits at Seattle.....	552
The Anderson Pressure Reducing Valve. Illustrated.....	553
The Use of Charcoal in Melting Brass.....	553
An Improved Ball-Bearing Universal Joint. Illustrated....	554
Judicial Decisions of Interest to Manufacturers.....	555
Editorial:	
New Iron and Steel Making Capacity.....	556
Reciprocity with Hydraulic Power Plants.....	557
Self-Help in Fighting Tuberculosis.....	557
The Constant Comparison of Cost.....	558
Correspondence.....	558
The Production of Coal in 1908.....	559
The Aluminum Castings Company.....	559
The Bureau of Standards to Supervise Steel Rail Tests....	560
Shipbuilding Plant for Port Arthur, Canada.....	560
The Production of Manganese and Manganiferous Ores in 1908.....	561
Advocating an Export Duty on Newfoundland Iron Ore....	561
Personal.....	562
A Modern Steel Roll Foundry.....	562
Obituary.....	562
The Production of Fluorspar in 1908.....	563
Boiler Inspection Departments Organize.....	563
Customs Decisions.....	563
Correction.....	563
News of the Works:	
Iron and Steel.....	564
General Machinery.....	564
Bridges and Buildings.....	564
Foundries.....	564
Power Plant Equipment.....	564
Fires.....	565
Hardware.....	565
Miscellaneous.....	565
The National Enameling & Stamping Company.....	565
A New Structural Tube Plant.....	565
The Iron and Metal Trades:	
A Comparison of Prices.....	566
Prices of Finished Iron and Steel, f.o.b. Pittsburgh....	566
Chicago.....	567
Pittsburgh.....	568
Birmingham.....	570
San Francisco.....	570
Philadelphia.....	571
St. Louis.....	572
Buffalo.....	572
Cleveland.....	573
Cincinnati.....	574
New York.....	574
Iron and Industrial Stocks.....	575
Metal Market.....	576
The Youngstown Foundry & Machine Company.....	576
The Colburn Machine Tool Company's Chicago Representation.....	576
The Public Supply of Electric Power in Great Britain....	577
The British Iron Trade.....	577
An Automobile Company's Expansion.....	577
The Machinery Trade:	
New York Machinery Market.....	578
Chicago Machinery Market.....	578
Milwaukee Machinery Market.....	579
Cincinnati Machinery Market.....	579
Cleveland Machinery Market.....	580
Philadelphia Machinery Market.....	580
Government Purchases.....	581
A New Blast Furnace at Youngstown.....	581
Trade Publications.....	582
Plans for Collecting the Corporation Tax.....	582
Pittsburgh Manufacturers Lease New Ore Docks.....	582
Hardware:	
Condition of Trade.....	583
Notes on Prices.....	586
Arrangement of Saws in Tool Case. Illustrated.....	587
The Question Box.....	588
Correspondence.....	589
Increased Water Power for the Goodell Company.....	590
Florida Retail Hardware Convention.....	590
The Michigan Retail Hardware Association. Portraits....	590
Making Good in Business.....	597
Price-Lists, Circulars, &c.....	598
Among the Hardware Trade.....	598
Requests for Catalogues, &c.....	598
The Pittsburgh Ventilating Sash Lock. Illustrated....	598
The Nasco Extension Truss Bridge Roller Skates. Illus....	598
Yale Bicentric Pin Tumbler Padlock. Illustrated.....	599
Pinion Wire.....	599
Brooks' Nailless Box Strap and Seal. Illustrated.....	599
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### Price-Lists, Circulars, Etc.

*Manufacturers in Hardware and related lines are requested to send us copies of new catalogues, price-lists, &c., for our Catalogue Department and for notice in this column.*

CHICAGO SPRING BUTT COMPANY, Union Park court and Carroll avenue, Chicago, Ill.: Catalogue No. 26 devoted to Spring Butts in a variety of styles and finishes and for various purposes, Ball Bearing Floor Hinges; Lavatory Spring Hinges, Strikes, Latches and Bolts; Fire Engine House Spring, Hinges and Checking Latches; Screen Door Hinges, Door Springs, Door Hangers, Push and Kick Plates, House Numbers, &c.

FEDERAL TOOL & SUPPLY COMPANY, Alton, Ill.: Catalogue of Handles, illustrating Axe, Pick, Grub Hoe, Post Maul, Sledge, Tool, Maul, Adze, Hammer and Hatchet, &c.; Shovel, Spade and Fork Handles, a recent addition to the company's products are also covered.

PUTNAM & Co., 244 Water street, New York: Catalogue illustrating and describing Store Rolling Ladders, both straight and bent.

J. STEVENS ARMS & TOOL COMPANY, Chicopee Falls, Mass.: Catalogue relating to Demi-Bloc Shot System Guns, having barrel and lug, all compressed and forged in one piece. A number of Double Barrel Hammer and Hammerless Shot Guns are illustrated.

IRONTON WOOD MANTEL COMPANY, Ironton, Ohio: Catalogue of Wood Mantels, showing 33 different designs which it manufactures and carries in stock. Eight of these designs—Nos. 277, 278, 279, 280, 281, 282, 283 and 284—have been put on the market since June 1. They were designed, it is explained, by the leading mantel designer in this country, and are thus advanced in style.

### AMONG THE HARDWARE TRADE.

Carl Engelbrecht has purchased the business of R. Sloan, Rankin, Ill., and carries Shelf and Heavy Hardware, Stoves, Tinware, Housefurnishings, Window Glass, Agricultural Implements, Paints, Oils and Sporting Goods.

Smith & Tilbury, successors to J. W. Smith, Nooksack, Wash., handle Hardware, Stoves, Ranges, Paints, Oils, Window Glass, Harness, Robes, Blankets, Whips, Shoe Findings, Agricultural Implements and Machinery.

The Crancer Hardware Company, successor to J. W. Crancer & Co., established 1857, in Leavenworth, Kan., has been incorporated with a capital stock of \$175,000. The company does a wholesale business in Shelf and Heavy Hardware, Housefurnishings, Window Glass, Farm and Garden Tools, Paints, Oils and Sporting Goods.

The R. P. Grubb Company, San Francisco, Cal., successor to Main-Winchester Company, have removed to 155 Second street. In addition to Hardware, the company handles Harness and Saddlery.

A new building is being erected by S. B. Hicks & Sons Company, Aberdeen, Wash. The company conducts a wholesale business in Wire Rope, Heavy Hardware, Iron, Steel, Belting, Oils, &c., with stores also at Seattle and Portland.

The Oregon Hardware Company, Portland, Ore., which was recently organized and incorporated, has opened a new store at 107 Sixth street. The lines carried include Builders' Hardware and all standard makes of Tools and Cutlery.

The Hardware business formerly conducted by Harry S. Vincent, Ft. Dodge, Iowa, has been taken over by the Thiede-Mueller Hardware Company, recently incorporated with a fully paid up capital stock of \$20,000. W. E. Mueller, who has been connected with the business since it was started 11 years ago by Mr. Vincent, will have the active management of the new concern. Although identified with the company as its official head, H. S. Vincent will take no active part in its management. The officers

of the company are: H. S. Vincent, president; Franz Thiede, vice-president; Bruno Thiede, treasurer; W. F. Mueller, secretary.

### Requests for Catalogues, Etc.

*The trade is given an opportunity in this column to request from manufacturers catalogues, price-lists, quotations, &c.*

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM COLWELL HARDWARE COMPANY, which has been incorporated in Mansfield, Ohio, with a capital of \$20,000, carrying Hardware, Stoves, Housefurnishings, &c.

FROM J. A. SHORS, who has purchased the stock of Huckfelt & Jack, in Beemer, Neb., handling Hardware, Stoves, Tinware, Agricultural Implements, &c.

FROM REEVES COUNTY MERCANTILE COMPANY, Toyah, Texas, which is opening a new department, including Hardware, Stoves and Implements.

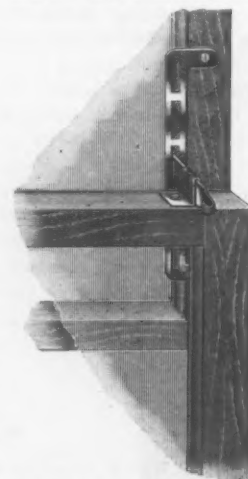
FROM R. H. NORRIS HARDWARE COMPANY, Childress, Texas, whose wholesale and retail stock has been partially destroyed by fire, the loss being fully covered by insurance. The lines handled include Shelf and Builders' Hardware, Sporting Goods, Glass and Queensware, Pipe and Mill Supplies, Windmills, Stoves, &c.

FROM FRIONA HARDWARE COMPANY, Friona, Texas, which has been incorporated with a capital stock of \$10,000. Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements and Sporting Goods will be handled.

FROM THE BARKER-DOLSON HARDWARE COMPANY, Wichita, Kan., which will open up a new store in the near future, carrying a line of General Hardware, Builders' Supplies, Pumps and Sporting Goods.

### The Pittsburgh Ventilating Sash Lock.

The sash lock herewith illustrated is designed for use on any window, whether equipped with sash weights



*The Pittsburgh Ventilating Sash Lock Adapted for Use on Windows with or without Sash Weights.*

or not. The bottom sash can be raised or the top sash lowered, or both, securely locking them at the desired height. The locks are packed with screws, and only a screw-driver is required to put them on windows, no mortising or cutting being required. There are no springs in the construction of the locks, which are made of high grade crucible steel, in antique copper plate, brush brass, nickel and gun metal finishes. The point is made that the strain on lock is lateral, which insures the greatest safety from intrusion. The locks can be easily taken off when tenant moves from one house to another. The lock is manufactured by the Pittsburgh Sash Lock Company, McKees Rocks, Pa.

### The Nasco Extension Truss Bridge Roller Skates.

The National Arms & Stamping Company, 430 Market street, Philadelphia, Pa., has added to its line of Nasco skates one with extension truss bridge, which adds greatly to its strength, making it possible for a person weighing 200 lb. to skate with perfect ease and without fear of bending it. The point is made that the skate

will sustain such a weight and stay rigid at any extended point. The skate is also made having a heel

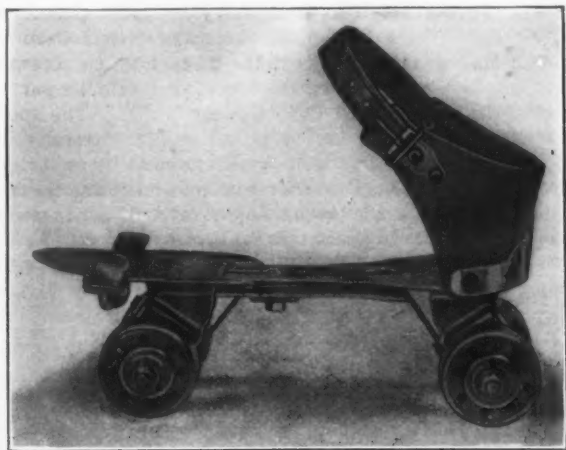


Fig. 1.—The Nasco Extension Truss Bridge Roller Skate.

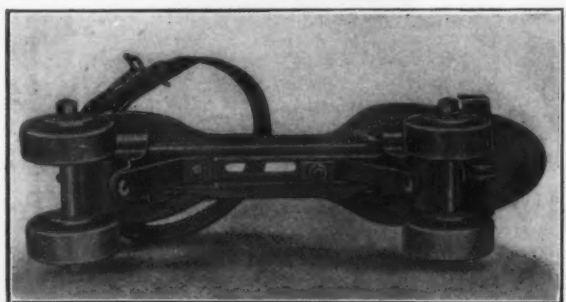


Fig. 2.—The Extension Truss Feature of Nasco Roller Skates with Plain Bearings and Hollow Steel Wheels.

strap instead of a high leather back, but identical in other respects with the skate illustrated.

### Yale Bicentric Pin Tumbler Padlock.

The Yale & Towne Mfg. Company, 9-15 Murray street, New York, has just brought out a group of five new



Yale Bicentric Pin Tumbler Padlock Arranged for Master Key and Grand Master Key.

padlocks, one style of which, the Bicentric pattern, is here shown, full size. It is a high type of padlock con-

struction, and embodies the company's new Bicentric system of master keying. By means of a separate plug for the master key, the lock may be arranged in any number of sets, each set controlled by a master key and all controlled by a grand master key; no two padlocks having keys alike. When so arranged the original simplicity and security of the pin tumbler mechanism is not impaired. The lock can also be adapted to safe deposit systems, in which case the use of both keys are required to operate the bolt. Its leading features are security, unlimited number of key changes and flexibility of arrangement as to subdivisions of groups. This lock has two paracentric keys, nickel bronze, coined and with gold plated bows. Other locks in the series, more moderately priced are the Baffler, Intrepid and Resolute, illustrated and fully described in a pamphlet just issued.

### Pinion Wire.

The Woburn Gear Works, 32 Nashua street, Woburn, Mass., has recently added to its products Pinion wire with drawn teeth in 8-ft. lengths. This is made in any pitch or shape tooth of brass, bronze or steel. The company formerly furnished Pinion wire with cut teeth only in 1-ft. lengths. The point is made that the new product is more economical in long pieces when running through a screw machine.

### Brooks' Nailless Box Strap and Seal.

In Fig. 1 is shown a device for pulling nonbreakable metal strap so tightly that it is imbedded in the wood

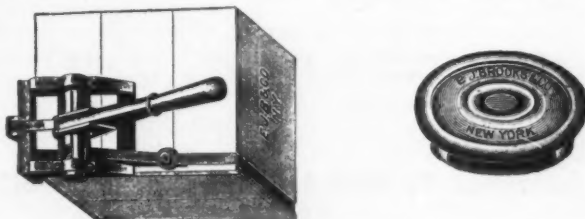


Fig. 1.—Brooks' Nailless Box Strap and Seal with Non-Breakable Metal Strap in Connection with a Strap Pulling Device.

on each corner of the box, drawing the boards of the box together. It can be applied to either side of a box or in the center. The strap is cut a little longer than the required length to go around the box and the two ends are passed through the slot in the seal, shown at the



Fig. 2.—Punch for Piercing the Seal, with a Gauge and Stripper Attached to the Base, So Made That the Seal and Strapping Is Pierced in the Center.

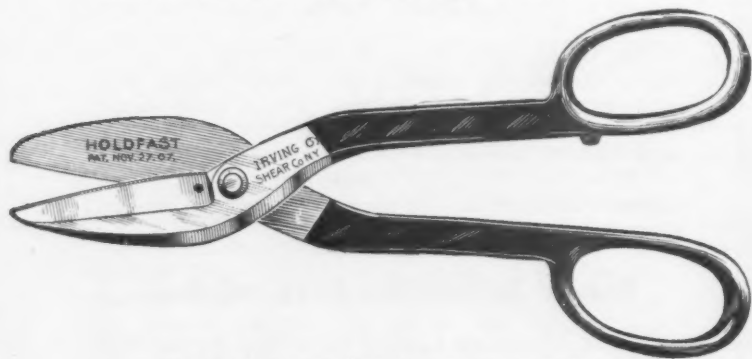
right in Fig. 1, in opposite directions. The upper loose end of the strap is then inserted in the slot of the roll in the pulling device, when the ratchet handle is worked



back and forth until the strap is sufficiently tightened on the case. The punch shown in Fig. 2 is then applied, which pierces the seal and both ends of the strap in the center, forming a burr, in such a manner that it is impossible to withdraw the strap without breaking the seal. Each seal is stamped with the name of the party using it. When seals are used in connection with the strap no nails are required, and only two nails are required on any box, no matter how large, if seals are not used. The outfit is offered by E. J. Brooks & Co., 227-229 Fulton street, New York.

### The Hold-Fast Tinnners' Snips.

The tinnners' snips shown herewith are made to hold the material to be cut so that it will not slip, and the teeth are so fine that they show hardly any burr on the

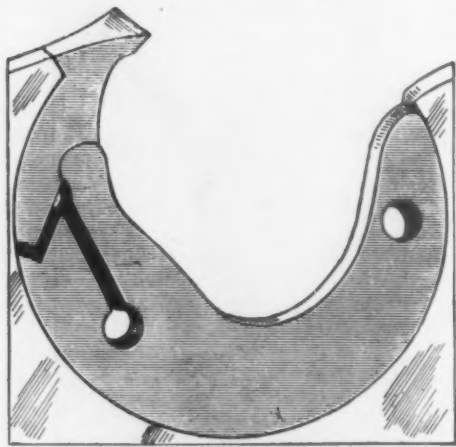


*The Holdfast Tinnners' Snips with Toothed Blades.*

tin cut. The snips are made with stright blades, curved blades and oval handles for cutting circles, and in all sizes, by the Irving Mfg. & Tool Company, 157 Chambers street, New York.

### Improved Perfection Chisel Inserted Tooth No. 3.

Emerson, Smith & Co., Beaver Falls, Pa., manufacturers of inserted toothed saws, have introduced chisel teeth for inserting in circular saws, the No. 3 size being shown herewith. The saws are made with three sizes of teeth, Nos. 2½, 3 and 4. The No. 2½ style is smaller than the illustration, and is used for edger saws and for high speed powerful saw mills, where a large num-



*Improved Perfection Chisel Inserted Tooth, No. 3.*

ber of teeth are required in the saw; and the No. 4 style is larger than No. 3. A great advantage claimed by the makers for the perfection chisel toother saw over the ordinary inserted tooth saw is that it can be used on as thin a gauge as a saw miller is accustomed to use with a solid toothed saw, as the locking device is such that the tooth is held firmly and that for all sawing purposes where large circular saws are used there is no trouble about making them of thin gauges.

### Imitation Osborne Dill Heads.

The Irving Mfg. & Tool Company, 157 Chambers street, New York, is manufacturing imitation Osborne drill heads to meet competition. They may be screwed onto any piece of threaded pipe of suitable length to enable the operator to drill through walls. The tools are designed for the use of plumbers, gas fitters, electricians, steam fitters, iron workers, carpenters, bricklayers, stone masons, wheelwrights and other mechanics. The heads are made in 11 sizes, to drill holes from 9-16 up to 4 in. in diameter.

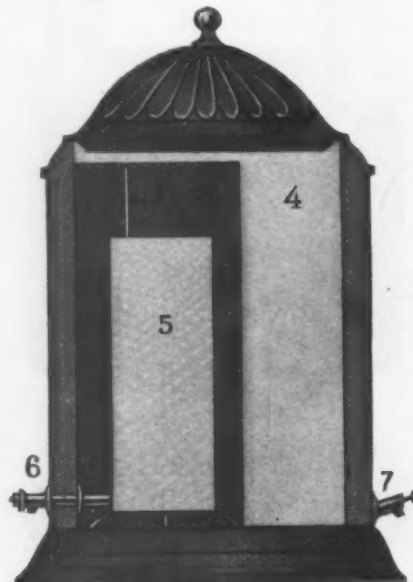
### The Sucro Pure Water Cooler and Filter.

The accompanying illustrations represent the Nos. 2 and 3 regular water coolers offered by the Sucro Filter



*Fig. 1.—The Sucro Pure Water Cooler and Filter, White Enamelled Metal Decorated in Royal Blue and Gold.*

Company, 42 Broadway, New York. Referring to Fig. 2, the designation 1 indicates the air vent; 2, raw water compartment; 3, perforated wall separating ice and raw water compartments; 4, ice compartment; 5, filtering lamelle; 6, filtered ice water faucet, and 7, refuse faucet. The filtering medium is the lamelle, or cell, as designated



*Fig. 2.—Cross Section of the Sucro Water Cooler and Filter.*

by 5, which is produced by fusing chemically pure asbestos cloth and a porcelainlike substance into a homogeneous, infrangible, heat and frost proof and dur-

able mass. Each square inch of filtering material is said to contain approximately 195,000 pores. The small pipe, 1, introduced into the upper part of the lamelle, acts as an air vent. It is explained that impurities cannot enter the pores, and as only a small percentage of them collect on the outer surface of the filtering material they can be readily removed by a brush, while most of the impurities immediately sink to the bottom of the tank containing the lamelle. No chemicals are used to assist filtration. The company manufactures other sizes and styles of coolers and filters, also municipal and other filtration plants. The principle of construction of the Suco system is universal in its application, in that it may be employed not only for the filtration of water, but as well for the filtration of other liquids, including gasoline, oils, vinegars, wines, spirits, &c.

### The Peerless Enameled Tea Kettle.

The Enterprise Enamel Company, Bellaire, Ohio, is putting on the market the seamless, one-piece enameled tea kettle shown herewith. The No. 8 is now ready and

holds 7 quarts. The company makes all its own dies and does all the work, from shaping the steel to the final enameling. The best steel is used, and the purity of the



The Peerless Seamless One-Piece Enameled Tea Kettle.

enamel and the resistance to all the acids of cooking are emphasized. The kettle is enameled in all styles.

## PAINTS, OILS AND COLORS

### Animal, Fish and Vegetable Oils -

Lard, Western, Raw.....	gal.	60 @ 61
State, Raw.....	gal.	60 @ 61
City, Raw.....	gal.	61 @ 62
Boiled, 1c gal. advance on Raw.....	gal.	61 @ 62
Raw, Calcutta, in bbls.....	gal.	75 @ 76
Lard, Prime Winter.....	gal.	88 @ 89
Extra No. 1.....	gal.	87 @ 88
No. 1.....	gal.	86 @ 87
Cotton-seed, Crude, f.o.b. mill.....	gal.	50 @ 51
Summer, Yellow, prime.....	gal.	50 @ 51
Summer, White.....	gal.	50 @ 51
Yellow, Winter.....	gal.	54 @ 55
Yellow, Acidless.....	gal.	57 @ 58
Menhaden, Brown, Strained.....	gal.	32 @ 33
Northern, Crude.....	gal.	22 @ 23
Southern.....	gal.	23 @ 24
Light Strained.....	gal.	32 @ 33
Bleached Winter.....	gal.	36 @ 37
Extra Bleached Winter.....	gal.	38 @ 39
Cocconut, Ceylon.....	gal.	48 @ 49
Cochin.....	gal.	48 @ 49
Cod, Domestic, Prime.....	gal.	38 @ 39
Newfoundland.....	gal.	40 @ 41
Red Elaine.....	gal.	43 @ 44
Saponified.....	gal.	54 @ 55
Olive, Yellow.....	gal.	1.35 @ 1.40
Neatfoot, Prime.....	gal.	55 @ 56
Palm, Lagos.....	gal.	57 @ 58

### Mineral Oils—

Black, 29 gravity, 25@30 cold	gal.	12 1/2 @ 13
Test, 15 cold test.....	gal.	13 @ 13 1/2
Summer.....	gal.	12 @ 12 1/2
Cylinder, light filtered.....	gal.	20 @ 20 1/2
Dark, filtered.....	gal.	17 1/2 @ 18
Paraffine, 903-907 sp. gravity.....	gal.	14 @ 14 1/2
903 sp. gravity.....	gal.	13 @ 13 1/2
883 sp. gravity.....	gal.	10 1/2 @ 11
Red.....	gal.	13 @ 13 1/2

### Miscellaneous—

Paraffin:		
White, Foreign.....	ton	\$18.50 @ 20.50
Amer., floated.....	ton	17.00 @ 18.00
Pittsburgh.....	ton	12.50 @ 15.00
Chalk in bulk.....	ton	3.00 @ 3.50

China Clay, Imported.....	gal.	11.50 @ 18.00
Cobalt, Oxide.....	100 lb	1.45 @ 2.60
Whiting, Commercial.....	100 lb	45 @ 50
Gilders.....	100 lb	52 @ 64
Ex. Gilders.....	100 lb	54 @ 68

### Putty, Commercial—

In bladders.....	100 lb	\$1.70 @ 2.00
In bbls. or tubs, 100 lb.....	100 lb	1.20 @ 1.45
In 1 lb to 5 lb tins.....	100 lb	2.50 @ 3.25
In 12 1/2 to 50 lb tins.....	100 lb	1.50 @ 1.90

### Spirits Turpentine—

In Oil bbls.....	gal.	52 1/2 @ 53
In Machine bbls.....	gal.	53 1/2 @ 54

### Glue—

Cabinet.....	12 @ 15
Common Bone.....	7 1/2 @ 9
Extra White.....	18 @ 24
Fish, liquid, 50 gal. bbls. per gal.....	60 @ 1.20
Foot Stock, White.....	12 @ 14
Foot Stock, Brown.....	9 @ 11
German Common Hide.....	10 @ 12
German Hide.....	10 @ 12
French.....	10 @ 12
Irish.....	10 @ 12
Low Grade.....	10 @ 12
Medium White.....	14 @ 19

### Gum Shellac—

Bleached, Commercial.....	17 @ 17 1/2
Bone Dry.....	21 @ 22
Butter.....	22 @ 23
Diamond.....	26 @ 27
Fine Orange.....	20 @ 21
A. C. G. & Co.....	18 @ 19 1/2
Light Orange.....	17 @ 19
Kala Button.....	22 @ 23
V.....	22 @ 23
Cetagon B.....	17 @ 17 1/2
T. S. O.....	24 @ 25

### Colors in Oil—

Black, Lampblack.....	12 @ 14
Blue, Chinese.....	24 @ 25
Blue, Prussian.....	32 @ 36

Blue, Ultramarine.....	13 @ 16
Brown, Vandyke.....	11 @ 14
Green, Chrome.....	12 @ 16
Green, Paris.....	42 @ 44
Sienna, Raw.....	12 @ 15
Sienna, Burnt.....	12 @ 15
Umber, Raw.....	11 @ 14
Umber, Burnt.....	11 @ 14

### White and Red, Lead &c.—

Lead, English white, in Oil—10% @ 10%	
Lead, American White:	
Dry and in Oil, 100, 250 and	
500 lb kegs.....	6%
Dry and in Oil, 25 and 50	
lb kegs.....	7%
Dry and in Oil, 12 1/2 lb kegs.....	7 1/2%
In Oil, 25 lb tin pails.....	7 1/2%
In Oil, 12 1/2 lb tin pails.....	7 1/2%
In Oil, 1, 2, 3 and 5 lb tin	
cans, ass't.....	8%
Red Lead and Litharge:	
In 100 lb kegs.....	7%
In 25 and 50 lb kegs.....	7 1/2%
In 12 1/2 lb kegs.....	7 1/2%
In lots of less than 500 lbs.	
1/2 c @ 1 lb advance over	
above prices of White and	
Red Lead and Litharge	
Lead, American, Terms: On lots of	
500 lbs and over, 60 days, or 2% for	
cash if paid in 15 days from date of	
invoice.	

### Zinc, Dry—

American, dry.....	5 1/2 @ 5 3/4
Red Seal (French process).....	6 1/2 @ 7
Green Seal.....	7 1/2 @ 7 3/4
German Red Seal (French	
process).....	7 1/2 @ 7 3/4
Green Seal.....	7 1/2 @ 8
White Seal.....	8 1/2 @ 9
French, Red Seal.....	8 1/2 @ 8 3/4
Green Seal.....	10 1/2 @ 10 3/4

### Dry Colors—

Black, Carbon.....	5 @ 10
Black Drop, American.....	3 1/2 @ 3

Black Drop, English.....	5 @ 15
Black, Ivory.....	16 @ 20
Lamp, commercial.....	3 @ 5
Blue, Celestial.....	4 @ 6
Blue, Chinese.....	30 @ 31
Blue, Prussian, Domestic.....	28 @ 30
Blue, Ultramarine.....	5 @ 15
Brown, Spanish.....	1 1/2 @ 1
Carmine, No. 40.....	2.65 @ 2.75
Green, Chrome, ordinary.....	3 1/2 @ 5
Green, Chrome, pure.....	17 @ 25
Metallic Paint, ton:	
Brown.....	\$16.50 @ \$22.00
Red.....	\$14.00 @ \$18.00
Ocher, American.....	ton \$12.00 @ \$15.00
American Golden.....	1 @ 5
French.....	1 1/2 @ 2
Foreign Golden.....	3 @ 4
Orange Mineral, English.....	10 @ 12
French.....	12 1/2 @ 13
German.....	12 @ 13
American.....	8 1/2 @ 10
Red, Indian, English.....	5 @ 7
American.....	3 @ 3 1/2
Red, Turkey, English.....	4 @ 10
Red, Tuscan, English.....	7 @ 10
Red, Venetian, Amer.....	100 lb \$9.75 @ 1.50
English.....	100 lb \$1.15 @ 1.60
Sienna, Italian, Burnt and	
Powdered.....	3 @ 9
Italian, Raw, Powdered.....	3 @ 7
American, Raw.....	2 1/2 @ 3
American Burnt and Pow'd.....	2 1/2 @ 3
Talc, French.....	ton \$18.00 @ 25.00
American.....	ton 15.00 @ 25.00
Terra Alba, French.....	100 lb .80 @ 1.00
English.....	100 lb .90 @ 1.00
American.....	100 lb No. 1, .75 @ .80
American.....	100 lb No. 2, .60 @ .65
Umber, T'key, Bot. & Pow.....	2 1/2 @ 3
Turkey, Raw and Powdered.....	2 @ 2 1/2
Burnt, American.....	2 @ 2 1/2
Raw, American.....	2 @ 2 1/2
Yellow Chrome, Pure.....	12 1/2 @ 13
Oxide Red, American.....	2 @ 7 1/2
Vermilion, English, Imported.....	870
Chinese.....	\$0.90 @ 1.00

# THE IRON AGE

The oldest paper in the world devoted to the interests of the Hardware, Iron, Machinery and Metal Trades, and a standard authority on all matters relating to those branches of industry.

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# Current Hardware Prices.

**General Goods.**—Goods which are made by more than one manufacturer are printed in *Italics*. The prices named represent those obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are usually given to larger buyers.

**Special Goods.**—Quotations printed in small type (Roman) relate to goods of particular manufacturers, who request the publication of the prices named and are responsible for their correctness. They usually represent the prices to the small trade, lower prices being generally obtainable by the fair retail trade, from manufacturers or jobbers.

**Range of Prices.**—A range of prices is indicated by means of the symbol @. Thus 33% @ 33% & 10% signifies that the price of the goods in question ranges from 33% per cent. discount to 33% and 10 per cent. discount.

**Names of Manufacturers.**—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued annually, a book of 376 pages, which is sent free of charge to every subscriber to *The Iron Age*. It gives a classified list of the products of our advertisers and thus serves as an up-to-date DIRECTORY of the Iron, Hardware and Machinery trades.

**Standard Lists.**—"The Iron Age Standard Hardware Lists," 218 pages, price \$2, prepaid, contains the list prices of many leading goods.

**Additions and Corrections.**—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

## Adjusters, Blind—

North's .....10%  
Upson's Patent, 3/4 gro., \$2.90 .....10%  
Zimmerman's—See Fasteners, Blind.

## Window Stop—

Ives' Patent .....10%  
Ives' Stop Bead Screws and Washers .....10%  
Taplin's Perfection .....10%

## Anti-Rattlers—

Fernald Mfg. Co., Burton Anti-Rattlers, 3/4 doz. pairs, Nos. 1, \$0.75; 2, \$0.60; 3, \$0.65; 4, \$1.00; 5, \$0.50.  
Fernald Quick Shifter, 3/4 doz. pairs .....\$2.00@3.00  
Spitzli Quick Shifter, 3/4 doz. pairs .....\$1.65@1.75

## Anvils—American—

Eagle Anvils .....3/4 lb @ 9¢  
Hay-Budden, Wrought .....3/4 lb @ 9¢  
Trenton .....3/4 lb @ 9¢

## Imported—

Swedish Solid Steel Paragon, 3/4 lb .....10¢@10¢  
Peter Wright & Sons, 3/4 lb, 94 to 349 lb, 11¢; 350 to 600 lb, 11¢.

## Anvil, Vice and Drill—

Millers Falls Co., \$18.00 .....15¢@10%

## Augers and Bits—

Com. Double Spur .....30%  
Jennings' Patn., Bright, 6.5¢@10¢  
Black Lip or Black .....65¢@65¢  
Boring Mach. Augers .....70%  
Car Bits, 12-in. twist .....40¢@10¢  
Ford's Auger and Car Bits .....40¢@5¢  
Ft. Washington Auger Co. .....35¢  
Forster Pat. Auger Bits .....25¢  
C. E. Jennings & Co.:  
No. 10 ext. lip, R. Jennings' list, 25¢@7¢  
No. 30, R. Jennings' list, 50¢  
Russell Jennings' .....25¢@13¢  
L'Hommedieu Car Bits .....15¢  
Mayhew's Countersink Bits .....45¢  
Pugh's Black .....20¢  
Pugh's Jennings' Pattern .....35¢  
Snell's Auger Bits .....60¢@10¢  
Snell's Bell Hangers' Bits .....60¢  
Snell's Car Bits, 12-in. twist .....80¢  
Snell's King Auger Bits .....50¢  
Snell's Star Auger Bits .....50¢@10¢  
Swan's Auger Bits .....65¢@10¢  
Swan's Jennings' Pattern .....50%

## Bit Stock Drills—

See Drills, Twist.

## Expansive Bits—

Ford's, Clark's Pattern .....60%  
C. E. Jennings & Co., Steer's Pat. 25¢  
Lavigne Pat., small size, \$18.00; large size, \$28.00 .....60¢@10¢  
Swan's .....60%

## Gimlet Bits—

Common Dbl. Cut .....\$3.00@3.25  
German Pattern, Nos. 1 to 10, \$4.75; 11 to 13, \$5.25

## Hollow Augers—

Bonney Pat., per doz. \$5.50@6.00  
Ames .....20¢@10%  
Universal .....20%

## Ship Augers and Bits—

Ship Augers .....40¢@10¢  
Ford's .....33¢@5¢  
C. E. Jennings & Co.:  
L'Hommedieu's .....6¢  
Watrous' .....33¢@7¢  
Snell's .....50%

## Awls—

Elmore Tool Mfg. Co.:  
Tinners' and Brad Awls .....55¢@7¢  
Scratch Awls .....60%

## Axes—

Single Bit, base weights: Per doz.  
First Quality .....\$4.75@5.00  
Second Quality .....\$4.25@4.50  
Double Bit, base weights:  
First Quality .....\$7.00@7.50  
Second Quality .....\$6.50@6.75

## Axles—

Iron or Steel.

Concord, Loose Collar .....4¢@4¢  
Concord, Solid Collar .....4¢@5¢  
No. 1 Common, Loose .....3¢@4¢  
No. 1 1/2 Com., New Style .....4¢@4¢  
No. 2 Solid Collar .....4¢@4¢  
Half Patent:  
Nos. 7, 8, 11 and 12 .....70%  
Nos. 13 to 14 .....70%  
Nos. 15 to 18 .....70¢@10¢@10¢  
Nos. 19 to 22 .....70¢@10¢@10¢

## Boxes, Axles—

Common and Concord, not turned .....1b. 5¢@6¢  
Common and Concord, turned, 1b. 6¢@7¢  
Half Patent .....1b. 9¢@10¢

## Bait—

Fishing—

Hendryx:  
A Bait .....20%  
B Bait .....25%  
Competitor Bait .....20¢@5¢

## Balances—

Sash—

Caldwell new list .....50¢@10%  
Pulman .....50¢@10%

## Spring—

Light Spring Balances 50¢@10¢@60%  
Chatillon's:  
Light Spg. Balances .....50¢@50¢@10%  
Straight Balances .....40¢@90¢@10%  
Circular Balances .....50¢@10%  
Large Dial .....30%

## Barb Wire—See Wire, Barb.

## Bars—

Crow—

Steel Crowbars, 10 to 40 lb. per lb., 2¢@—¢

## Towel—

No. 10 Ideal, Nickel Plate, 3/4 gro. \$8.50

## Beams, Scale—

Scale Beams .....40¢@10¢@10%  
Chatillon's No. 1 .....30%  
Chatillon's No. 2 .....40%

## Beaters, Carpet—

Holt-Lyon Co.:  
No. 12 Wire Coppered 3/4 doz. \$0.80;  
Tinned .....\$0.85  
No. 11 Wire Coppered 3/4 doz. \$1.15;  
Tinned .....\$1.20  
No. 10 Wire Tinned .....3/4 doz. \$1.50

## Beaters Egg—

Dover Stamping & Mfg. Co.:  
Genuine Dover, per gro., No. 1, Tumbler Size, \$7.50; No. 2, Family Size, \$7.50; No. 3, Extra Family Size, \$24.00; No. 4, Hotel Size, \$30.00.  
Holt-Lyon Co.:  
No. 5, Jap'd, \$0.80;  
No. A, Jap'd, \$1.15; No. B, Jap'd, \$1.85; No. 6, Jap'd, \$1.65.  
Lyon, Jap'd, per doz., No. 2, \$1.35.  
Taplin Mfg. Co.:  
Improved Dover, per gro., No. 60, \$6.00; No. 75, \$6.50; No. 100, \$7.00; No. 102, Tin'd, \$8.50; No. 150, Hotel, \$15.00; No. 152, Hotel Tin'd, \$17.00; No. 200, Tumbler, \$8.50; No. 202, Tumbler Tin'd, \$9.50; No. 300, Mammoth, per doz., \$25.00.

## Bellows—

Blacksmith Standard List:  
Split Leather .....60¢@60¢@10%  
Grain Leather .....50¢@50¢@10%

## Hand—

Inch. 6 7 8 9 10  
Doz. \$4.50 5.50 6.00 7.00 7.50

## Molders—

Inch. 10 12 14 16  
Doz. \$8.50 11.00 13.50 14.50

## Bells— Cow—

Wrought Cow Bells .....75%  
Jersey .....75¢@10%  
Texas Star .....50%

## Door—

Home, R. & E. Mfg. Co.'s .....55¢@10%  
Reading Hardware Co. ....50%

## Hand—

Polished, Brass .....60¢@60¢@10%  
White Metal .....60¢@60¢@10%  
Nickel Plated .....50¢@10%  
Siccas .....50¢@10%  
Cone's Globe Hand Bells .....33¢@35%

## Miscellaneous—

Farm Bells .....1b., 2¢@3¢  
Church and School .....60¢@60¢@5%

## Belting— Leather—

First Quality, Ex. Hy., Strictly Short Lap .....60¢@10%  
Standard .....70¢@10¢@10¢@5%  
Light Double .....75¢@10%  
Cut Leather Lacing .....45¢@50%  
Leather Lacing Sides, per sq. ft. 25¢

## Rubber—

Competition (Low Grade) .....70¢@10¢@75%  
Standard .....60¢@10¢@70%  
Best Grades .....50¢@50¢@10%

## Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters .....20%

## Bicycle Goods—

John S. Lang's Son & Co.'s 1909 list:  
Chain, Parts, Spokes .....50%  
Tubes .....60%

## Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See Augers and Bits.

## Blocks Tackle—

Common Wooden .....75¢@75¢@10%  
B. & L. B. Co.:  
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50¢@10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50¢@10%; Wire Rope Snatch, 50%  
Lane's Patent Automatic Lock and Junior .....30%  
See also Machines, Hoisting.

## Boards, Stove—

Paper and Wood Lined 50¢@10¢@60%  
Embossed .....50¢@10¢@60%

## Bobs, Plumb—

Keuffel & Esser Co. ....33¢@10%

## Boils

Carriage, Machine, &c.—

Common Carriage (cut thread):  
% 6 and smaller .....75¢@10%  
Larger and longer .....70¢@10%  
Common Carriage (roiled thread):  
% 6, smaller and shorter .....75¢@10¢@5%  
Phila. Eagle, \$3.00 list .....80¢@—  
Bolt Ends, with C. & T. Nuts, 70¢@10%  
Machine (Cut Thread):  
% 4 and smaller .....75¢@10¢@5%  
Larger and longer .....70¢@10¢@5%

## Door and Shutter—

Wrought Iron:  
Wrought Barrel Japanned, 80¢@10¢@85%  
Barrel Bronzed .....60¢@10¢@70%  
Spring .....70¢@10¢@80%  
Square Neck .....75¢@10¢@80%  
Square .....80¢@80¢@10%  
Ives' Mortise .....10%  
Ives' Wrought Metal .....10%

## Expansion—

F. H. Evans' Crescent .....40¢@60%  
Richards Mfg. Co. ....55¢@10%  
Star Expansion Bolt Co. ....55¢@10%

Star, Lag Screw Type, 60¢@10¢@5¢@2¢  
Star, Wood Screw Type .....60%  
Star, Machine, Single Wedge .....60%  
Star, Machine, Double Wedge 60¢@10%  
Star Toggle Bolts .....60%  
Steward & Komain Mfg. Co.:  
Style No. 13, Double .....60¢@10%  
Style No. 1, Single .....60¢@10%  
Style No. 100, Dbl. Jaw, Single .....55%  
Lag Screw .....66%  
Star Screw Anchors, Hollow .....40%

## Plow and Stove—

Plow .....65¢@5¢@70%  
Stove .....85¢@5¢@10%

## Tire—

Common Iron .....80%  
Norway Iron .....80%  
American Screw Co.:  
Norway Phila., list Oct. 16, '94 .....80%  
Eagle Phila., list Oct. 16, '94 .....82%  
Bay State, list Dec. 28, '99 .....80%  
Franklin Moore Co.:  
Norway Phila., list Oct. 16, '94 .....80%  
Eagle Phila., list Oct. 16, '94 .....82%  
Eclipse, list Dec. 28, '99 .....80%  
Russell, Burdall & Ward Bolt & Nut Co.:  
Empire, list Dec. 28, '99 .....80%  
Norway Phila., list Oct. '94 .....80%  
Eagle .....82%  
Shelton Co.:  
Tiger Brand, list Dec. 28, '99 .....80%  
Phila., Eagle, list Oct. 16, 1881 .....82%  
Upson Nut Co.:  
Tire Bolts .....80%

## Borers, Bung—

Enterprise Mfg. Co., No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.50 each .....25%

## Boxes, Mite—

C. E. Jennings & Co. ....25%  
Langdon, New Langdon and Langdon Improved, 20¢@10%; Langdon Acme .....15¢@10%

## Braces—

Common Ball .....\$1.50@1.75  
Barber's .....50¢@10¢@60¢@10%  
Fray's Genuine Spofford's .....60%  
Fray's No. 61, 105, 200, 514 .....50%  
C. E. Jennings & Co. ....50¢@5%  
Mayhew's Ratchet .....60%  
Mayhew's Quick Action Hay Pat. 50%  
Millers Falls Drill Braces .....25¢@10%  
P. S. & W. Co., Peck's Pat. Revised List .....60¢@65%

## Brackets—

Wrought Steel .....80¢@5¢@80¢@10%  
Griffin's Pressed Steel .....75¢@75¢@10%  
Griffin's Folding Brackets .....70¢@10%  
Stanley's Pressed Steel .....75¢@10¢@5%  
Stanley's Folding Brackets .....70¢@10¢@5%  
Taplin Victor Handy Egg Beater Bracket .....3/4 doz. \$1.50

## Broilers—

Kilbourne Mfg. Co. ....75¢@20%  
Wire Goods Co. ....75¢@10%

## Buckets, Galvanized—

Mfr's list, price per gross, subject to discount of 10¢@7¢@5¢@10¢@5%  
Quart. ....10 12 14  
Water, Light, \$28.35 30.75 34.75  
Water, Ex. Heavy 46.85 49.35 53.25  
Fire, Rd. Btm. ....33.50 35.90 39.90  
Well .....37.35 41.35 45.35

## Butts—

Brass—

Wrought Cast Brass, Tiebout's .....65¢@10%  
Wire Goods Co. ....75¢@10%

## Wrought Steel—

BRIGHT:  
Light Narrow, Light Reversible .....75¢@5%  
Reversible and Broad 75¢@10%  
Loose Joint, Narrow, Light Inside Blind, etc. ....75%  
Back Flaps, Table Cheat 70%  
BRONZED:  
Light Narrow, Loose Pin, 55%  
Light, Loose Pin, Ball Tip 65%  
Broad .....55%

Extra, 5¢@

**Cages, Bird—**

Hendryx Brass: Series 3000, 5000,  
1100, net list: 1200, 15%; 200, 300,  
900 ..... 30%  
Hendryx Bronze: Series 700, 800, 3000 ..... 30%  
Hendryx Enameled ..... 35%

**Calks, Toe and Heel—**

Blunt, 1 prong, per 100 lb. \$3.50 @ \$3.85  
Sharp, 1 prong, per 100 lb. \$4.00 @ \$4.35

Burke's, 1 pg. Blunt Toe, 3/4¢; 2 pg.  
Blunt Toe, 4/4¢; 1 pg. Sharp Toe,  
1/4¢; 2 pg. Sharp, 4/4¢; Blunt  
Heel, 4/4¢; Sharp Heel, 4/4¢  
Lautier, Blunt, 4/4¢; Sharp, 4/4¢  
Perkins, Blunt, 1 lb, 3.65¢; Sharp,  
4.15¢

**Caps—Primers—**

Berdan Primers, \$2 per M. 20¢  
Primer Shells and Bullets, 15¢  
All other primers per M. \$1.52 @ \$1.60

**Cartridges—**

Blank Cartridges:  
32 C. F., \$5.50 ..... 10¢  
38 C. F., \$7.00 ..... 10¢  
22 cal. Rim, \$1.50 ..... 10¢  
32 cal. Rim, \$2.75 ..... 10¢  
B. B. Caps, Con. Ball, Stead. \$1.00  
B. B. Caps, Round Ball, \$1.10  
Central Fire ..... 25¢  
Target and Sporting Rifle, 15¢  
Primed Shells and Bullets, 15¢  
Rim Fire, Sporting ..... 50¢  
Rim Fire, Military ..... 15¢

**Casters—**

Bed ..... 65¢ @ 70¢  
Plate ..... 60¢ @ 65¢  
Philadelphia ..... 70¢ @ 75¢  
Acme, Ball Bearing ..... 35¢  
Gem (Roller Bearing) ..... 70¢ @ 100¢  
Steel Gem (Roller Bearing) ..... 70¢  
Standard Ball Bearing ..... 45¢  
Yale (Double Wheel) low list ..... 40¢ @ 10¢

**Chain, Proof Coil—**

American Coil, Straight Link:  
3-16 1/4 5-16 3/4 1/2 1/4  
7-16 4-8 3-8 3-16 3-10 3-00  
3/4-1/2 1 1/2 to 1 1/4 inch.  
\$2.90 3.00

German Coil ..... 70¢ @ 75¢  
German Pattern Coil:  
6-0 to 1 ..... 70¢ @ 75¢  
2 and 3 ..... 60¢ @ 70¢  
4, 5 and 6 ..... 50¢ @ 60¢

**Halter—**

Halter Chains ..... 60¢ @ 65¢  
German Pattern Halter Chains,  
list July 24, '07 ..... 70¢ @ 75¢  
Covert Mfg. Co. .... 35¢ @ 5%

**Trace, Wagon, &c.—**

Traces, Western Standard: 100 pr.  
6 1/4-6-3, Straight, with ring, \$25.00  
6 1/4-6-2, Straight, with ring, \$27.00  
6 1/4-8-2, Straight, with ring, \$30.00  
6 1/4-10-2, Straight, with ring, \$35.00  
NOTE—Add 2c per pair for Hooks  
Twist Traces: add per pair for Nos. 2  
and 3, 2c; No. 1, 3c; No. 0, 4c to price of  
Straight Link.  
Eastern Standard Traces, Wag-  
on Chain, &c. .... 70¢ @ 10¢

**Miscellaneous—**

Jack Chain:  
Iron ..... 60¢ @ 10¢  
Brass ..... 60¢ @ 10¢  
Safety and Plumbers' Chain, 75¢  
Gal. Pump Chain, 1 lb., 4 1/2¢  
Bridgeport Chain Co.:  
Triumph Halter and Coll. 35¢ @ 40¢  
Triumph Dog ..... 50¢ @ 60¢  
Brown Halter and Coll. 45¢ @ 50¢  
Covert Mfg. Co.:  
Breast, Halter, Heel, Rein, Stal-  
ion ..... 40¢  
Oneida Community:  
American Halter, Dog and Kennel  
Chains ..... 35¢ @ 40¢  
Niagara Dog Leads and Kennel  
Chains ..... 45¢ @ 50¢  
Wire Goods Co.:  
Dog Chain, 1 lb. .... 70¢  
Universal Dbl.-Jointed Chain, 50¢ @ 10¢

**Chain and Ribbon, Sash—**

Oneida Community:  
Steel Chain ..... 60¢  
Pullman:  
Bronze Chain, 60%; Steel Chain,  
Coppered ..... 60¢ @ 10¢  
Sash Chain Attachments, per set, 88¢  
Aluminum Sash Ribbon, per 100  
ft. .... \$2.00 @ \$5.00  
Sash Ribbon Attachments, per set, 8¢

**Chalk—**

Carpenters' Blue ..... 50¢ @ 55¢  
Carpenters' Red ..... 50¢ @ 55¢  
Carpenters' White ..... 50¢ @ 55¢

**Checks, Door—**

Bardley's ..... 45¢  
Reading, Ogden ..... 50¢ @ 55¢  
Pullman, per gro. .... \$4.00  
Russwin ..... 35¢ @

**Chests, Tool—**

American Tool Chest Co.:  
Boys' Chests, with Tools ..... 55¢  
Youths' Chests, with Tools ..... 40¢  
Gentlemen's Chests, with Tools ..... 30¢  
Farmers' Chests, with Tools ..... 20¢  
Machinists' and Pipe Fitters'  
Chests, Empty ..... 45¢  
Tool Cabinets ..... 45¢  
C. E. Jennings & Co.'s Machinists'  
Tool Chests ..... 75¢

**Chisels—**

Socket Framing and Firmer  
Standard List, 80¢ @ 10¢  
Ruck Bros. .... 30¢  
C. E. Jennings & Co.:  
Socket Firmer No. 10 ..... 25¢ @ 75¢  
Socket Framing No. 15 ..... 25¢ @ 75¢  
Swan's ..... 65¢ @ 70¢  
L. & I. J. White Co. .... 30¢ @ 35¢

**Tanged—**

Tanged Firmers ..... 35¢ @ 40¢  
Ruck Bros. .... 30¢  
C. E. Jennings & Co. Nos. 191, 191, 25¢  
L. & I. J. White Co. .... 25¢ @ 35¢

**Cold—**

Cold Chisels, good quality, 13¢ @ 15¢  
Cold Chisels, fair quality, 11¢ @ 12¢  
Cold Chisels, ordinary, 9¢ @ 10¢  
Elmore Tool Mfg. Co.:  
Cold Chisels ..... 50¢ @ 55¢

**Chucks—**

Almond Drill Chucks ..... 35¢  
Almond Turret Six-Tool Chuck ..... 40¢  
Beach Pat. each \$8.00 ..... 35¢ @ 50¢  
Cincinnati Chuck Co.:  
Independent 4-Jaw Reversible ..... 35¢  
Jacobs' Drill Chucks ..... 35¢  
Morrow Ball Bearing Drill Chucks ..... 35¢  
Skinner Lathe Chucks ..... 35¢  
Universal, Reversible Jaws ..... 35¢  
Universal, Com. Style Jaws ..... 40¢  
Combination, Reversible Jaws ..... 35¢  
Combination, Com. Style Jaws ..... 40¢  
Round Body or Box Body, 2 Chuck  
Geared Scroll Chucks ..... 25¢  
Drill Chucks:  
New Model, 25%; Skinner Patent, 25%  
Positive Drive ..... 25¢  
Planer Chucks ..... 25¢  
Stawar Drill Vises ..... 30¢  
Drill Press Vises ..... 30¢  
Face Plate Jaws ..... 35¢  
Standard Tool Co.:  
Improved Drill Chuck ..... 45¢  
Union Mfg. Co.:  
Combination, Nos. 1, 2, 3, 4, 5, 6,  
7, 8 and 10, 40%; No. 21, 35%  
Scroll Combinations, Nos. 83 and  
84 ..... 30¢  
Geared Scroll, Nos. 33, 34 and 35, 25%  
Independent Iron, Nos. 19 and 318, 35%  
Independent Steel, No. 64, 25%  
Union Drill, Nos. 000, 00, 100, 101,  
102, 103, 104, 105, 106, 107, 108,  
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**Clamps—**

Carriage Makers', Star, P. S. & W.  
Co. .... 50¢ @ 55¢  
Besly, Parallel ..... 35¢ @ 10¢  
Hammer & Co.:  
Adjustable ..... 20¢ @ 5¢  
Carriage Makers' H. P. Screw ..... 50¢  
Myers' Hay Rack ..... 50¢  
Saw Clamps, see Vises, Saw Filers

**Cleaners, Drain,**

Ivan's Champion, Adjustable ..... 50¢  
Ivan's Champion, Stationary ..... 40¢

**Sidewalk—**

American Fork & Hoe Co.:  
Star, 1/2 doz., Socket, \$4.00;  
Shank, 1/2 doz., X 7/8, \$3.50; Shank,  
X 8 ..... \$3.75

**Cleavers, Butchers—**

Foster Bros. .... 30¢  
L. & I. J. White Co. .... 30¢

**Clippers, Horse and Sheep—**

Chicago Flexible Shaft Co.:  
1802 Chicago Horse, each, \$10.75  
20th Century Horse, each, \$5.00  
Lightning Belt Horse, each, \$15.00  
Chicago Belt Horse, each, \$20.00  
Stewart's Enclosed Gear Ball  
Bearing Horse, each, \$7.50  
Stewart's New Model Sheep  
Shearing Machine, each, \$12.75  
Stewart Enclosed Gear Shear-  
ing Machine, No. 8, each, \$2.75

**Clips, Axle—**

Regular Styles ..... 80¢ @ 10¢

**Cocks, Brass—**

Hardware Hat:  
Plain Ribbs, Globe, Kerosene,  
Racking, Liquor, Bottling,  
&c ..... 75¢  
Compression Ribbs ..... 75¢

**Compasses, Dividers, &c.**

Ordinary Goods ..... 75¢ @ 75¢

**Conductor Pipe—**

L. C. L. to Dealers:  
Gal. Steel, Charcoal, Copper.

Northeastern:  
70¢ @ 10¢ ..... 50¢ @ 10¢  
Eastern:  
70¢ @ 10¢ ..... 50¢ @ 10¢  
Central:  
70¢ @ 10¢ ..... 50¢ @ 10¢  
Northwestern:  
70¢ @ 10¢ ..... 50¢ @ 10¢  
Western:  
70¢ @ 10¢ ..... 50¢ @ 10¢  
Tennessee:  
70¢ @ 10¢ ..... 50¢ @ 10¢  
Southern:  
70¢ @ 10¢ ..... 50¢ @ 10¢  
Southwestern:  
70¢ @ 10¢ ..... 50¢ @ 10¢

Terms, 60 days: 2% cash 10 days. Fac-  
tory shipments generally delivered.  
See also Eave Troughs.

**Coolers, Water—**

L. & G. Mfg. Co.:  
Galvanized, Lined, side handles,  
Gal. 2 3 4 6 8  
Each \$1.30 1.60 2.00 2.30 3.00  
White Enameled Lined, Side  
Handles:  
Gal. 2 3 4 6 8  
Each \$2.40 2.80 3.50 4.75 5.75  
Agate Lined, Side Handles:  
Gal. 2 3 4 6 8  
Each \$3.00 3.40 4.50 5.30 6.60

**Coppers, Soldering—**

Soldering Coppers, 3 lb. to pair  
and heavier, 21¢; lighter than  
3 lb. to pair ..... 23¢

**Cord— Sash—**

Braided, Drab ..... 1b. 35¢  
Braided, White, Com. Nos. 8  
to 12, 25¢; No. 7, 25 1/4¢; No.  
6, 26 1/2¢  
Cable Laid Italian, lb., No. 18, 37¢  
Italian, lb., A, No. 18, 25¢; B, 22¢  
Common India ..... 1b. 11¢ @ 11 1/2¢  
Cotton Sash Cord, Twisted, 18¢ @ 20¢  
Patent Russia ..... 1b. 20¢  
Cable Laid Russia ..... 1b. 21¢  
India Hemp, Br'd'd ..... 1b. 21¢  
India Hemp, Twisted ..... 1b. 13¢ @ 14¢  
Patent India, Twisted ..... 1b. 17¢  
Eddystone, Braided, Nos. 8 to 12,  
26¢; 7, 26 1/2¢; 6, 27 1/2¢  
Harmony Cable Laid Italian, Nos. 7  
to 10 ..... 1b. 23¢  
Pullman:  
Wire Sash Cord ..... 10¢  
Sash Cord Attachments, per 100, \$2.00  
Samson, Nos. 8 to 12:  
Braided, 1 lb., Drab Cotton,  
55¢; Italian Hemp, 40¢ @ 45¢  
50¢; Linen, 65¢; White Cot-  
ton, 50¢; Spot Cord, 50¢  
Massachusetts, White, 1 lb. 40¢  
Massachusetts, Drab, 1 lb. 45¢  
Phoenix, White, Nos. 8 to 12, 27¢  
Silver Laid, per lb.:  
A, Drab, 45¢; A, White, 40¢;  
B, Drab, 40¢; B, White, 35¢;  
Italian Hemp, 40¢; Linen, 57 1/2¢  
See also Chain and Ribbon.

**Wire, Picture—**

Full Length ..... 90¢ @ 10¢  
Short Length ..... 90¢ @ 10¢  
Hendryx Standard Wire Picture Cord  
90¢ @ 10¢  
Turner & Stanton Co. Wire Picture  
Cord ..... 90¢ @ 10¢

**Cradles—**

Grain ..... 50¢

**Crayons—**

White Round Crayons, Cases, 100  
gro., \$8.00, \$8.50, \$9.00 and \$10.00  
according to grade.  
Zelnicker's Lumber:  
White and Purple, Indelible, \$7.50  
Blue, Red, Green, Yellow and  
Terra Cotta, \$6.50; Black, \$4.50  
Giant Lumber, 3/4 in. x 15-16 in.,  
round, all colors, \$12.00; Indeli-  
bles, \$11.00; Blacks, \$10.00  
Genuine Soapstone, Metal Workers',  
5 in. x 4 in. Round, \$2.50; 5 in. x  
3 1/2 in. Square, \$1.75; 5 x 1 1/2 x 3-16,  
\$2.50; 5 x 1 1/4 x 3-16, \$3.00  
Suremark, Black, \$2.25; Blue, Red  
and Yellow ..... \$2.50

**Crooks, Shepherds—**

American Fork & Hoe Co.:  
Montana ..... 1/2 doz. \$1.50

**Cultivators—**

American Fork & Hoe Co.:  
Victor Garden ..... 50¢ @ 10¢

**Cutlery, Table—**

International Silver Company:  
No. 12 M'd'm Knives, 1847, 1/2 doz. \$3.50  
Star, Eagle, Rogers & Hamilton  
and Anchor ..... 1/2 doz. \$3.00  
Wm. Rogers & Son ..... 1/2 doz. \$2.50

**Cutters— Glass—**

H. H. Mayhew Co. .... 40%

**Meat and Food—**

Enterprise:  
Nos. 5 10 12 22 32  
Each \$2.33 \$2.75 \$1.50 \$6 25¢ @ 7 1/2¢

No. 202, \$1.50 ..... 40¢ @ 7 1/2¢  
P. S. & W. Co.:  
Ideal ..... 40¢ @ 10¢  
Hales ..... 60¢ @ 5¢  
Little Giant, 1/2 doz. 40¢ @ 50¢  
Nos. 305 310 312 320 325  
\$35.00 \$48.00 \$14.00 \$72.00 \$68.00  
New Triumph No. 605, 1/2 doz. \$28.00



**Emery, Turkish—**

4 to 51 to	46	220	Flour.
Keps.....lb. 5	5 1/2	5 1/2	3 1/2
1/2 Keps.....lb. 5 1/2	5 1/2	5 1/2	3 1/2
1/4 Keps.....lb. 5 1/2	6	6	4
10-lb. cans,			
10 in case.....6 1/2	7	7	6
10-lb. cans, less			
than 10.....10	10	10	8
Less quantity.....10	10	10	8

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

**Extensions, Bit—**

Ford's Auger Bit Extensions.....40¢

**Extinguishers—**

Royal Mfg. Co. Fire, 1/2 doz., \$12.00.....50%

**Fasteners, Blind—**

Zimmerman's Jap'd and Galv., 65%  
Bronze and Plated.....50%  
Walling's Patent.....50%  
Upson's Patent.....40%

**Cord and Weight—**

Ives, 1/2 gro., \$1.06.....10%  
Titan, 1/2 gro., \$1.06.....10%

**Corrugated—**

Acme Corrugated Fasteners.....70%

**Faucets—**

Cork Lined.....50¢ to 60¢  
Metallic Key, Leather Lined.....60¢ to 70¢  
Red Cedar.....40¢ to 50¢  
Petroleum.....70¢ to 75¢  
B. & L. B. Co.:  
Metal Key.....60¢ to 10¢  
Star.....60¢  
West Lock.....50¢ to 10¢  
John Sommer's Peerless Tin Key.....50¢  
John Sommer's Boss Tin Key.....50¢  
John Sommer's Victor Mtl. Key.....50¢  
John Sommer's Duplex Metal Key.....60¢  
John Sommer's Diamond Lock.....40¢  
John Sommer's L.X.L. Cork Lined.....50¢  
John Sommer's Reliable Cork Lined.....50¢  
John Sommer's Chicago Cork Lined.....50¢  
John Sommer's O. K. Cork Lined.....50¢  
John Sommer's No. Brand, Cedar.....50¢  
John Sommer's Perfection, Cedar.....40¢  
Self Measuring:  
Enterprise, Self Measuring and Pump, 1/2 doz., \$36.00.....40¢ to 10¢  
Lane's, 1/2 doz., \$36.00.....40¢ to 10¢

**Files— Domestic—**

Best Brands.....70¢ to 10¢ to 75¢ to 10¢  
Standard Brands.....75¢ to 10¢ to 80¢ to 10¢  
Lower Grade.....75¢ to 10¢ to 80¢ to 10¢  
Dianston's Superfine.....60¢  
Fitchburg.....70¢  
Gold Medal.....70¢  
Heller Bros.....70¢ to 10¢ to 75¢ to 10¢  
Liveright Bros., Gold Medal.....70¢  
McCaffrey's American Standard.....60¢ to 10¢ to 45¢ to 10¢  
McCaffrey's Swiss Pattern.....45¢ to 10¢  
Simonds.....70¢

**Fixtures, Fire Door—**

Richards Mfg. Co.:  
Universal, No. 103; Special, No. 104.....\$3.75  
Fusible Links, No. 96.....50¢  
Expansion Bolts, No. 197.....60¢ to 10¢

**Grindstone—**

Net Prices:  
Inch.....15 17 19 21  
Per doz.....\$3.00 3.25 3.55 4.00  
Peck, Stow & Wilcox Co.:  
15 17 19 21 24  
\$1.00 1.40 1.75 5.50 6.50.....30%  
Reading Hardware Co.....50¢ to 10¢

**Forks—**

American Fork & Hoe Co.:  
Iowa Dig-Ezy Potato.....70¢ to 5¢  
Hay, Regular, 3-time.....45¢ to 20¢ to 12¢  
Hay, Regular, 4-time.....60¢ to 7¢ to 5¢  
Champion, Hay.....60¢ to 12¢  
Acme, Hay.....60¢ to 12¢  
Manure, Regular, 4-time.....65¢ to 5¢  
Manure, Regular, 5 and 6 time.....70¢  
Champion, Manure.....65¢ to 5¢  
Columbia, Manure.....70¢  
Acme, 4-time.....60¢ to 10¢ to 5¢  
Round Shoulder Header, 4-time.....65¢  
Champion, Header.....65¢  
Dakota, Header.....65¢  
Kansas Header.....65¢  
Wood, Barley.....35¢ to 5¢  
Steel, Barley.....60¢ to 5¢  
Columbia, Spading.....70¢ to 7¢ to 5¢

**Frames— Wood Saw—**

White, 8'x1 Bar, per doz.....\$1.00  
Red, 8'x1 Bar, per doz.....\$1.00 to 1.25  
Red, Dbl. Brace, per doz.....\$1.40 to 1.50

**Freezers, Ice Cream—**

Qt.....1 2 3 4 8  
Each.....\$1.25 \$1.60 \$1.90 \$2.20 \$2.80

**Fuse— Per 1000 Feet.**

Hemp.....\$2.75  
Cotton.....5.20  
Waterproof Sul. Taped.....3.65  
Waterproof 10lb. Taped.....4.40  
Waterproof Tpl. Taped.....5.15

**Gates, Molasses and Oil—**

Stebbins' Pattern.....80¢ to 85¢

**Gauges—**

Marking, Mortise, &c., 50¢ to 10¢  
Chapin-Stephens Co.:  
Marking, Mortise, &c., 50¢ to 10¢  
Dianston's Marking, Mortise, &c., 50¢ to 10¢  
Wire, Brown & Sharpe's.....35¢ to 4¢  
Wire, Morse's.....25¢  
Wire, P., S. & W. Co., 25¢

**Gimlets— Single Cut—**

Numbered assortments, per gro.  
Nail, Metal, No. 1, \$2.00; 2, \$2.30  
Spike, Metal, No. 1, \$4.00; 2, \$4.30  
Nail, Wood Handled, No. 1, \$2.50; 2, \$2.60  
Spike, Wood Handled, No. 1, \$4.30; 2, \$4.60

**Glasses, Level—**

Chapin-Stephens Co.....65¢ to 65¢ to 10¢  
Dianston & Sons.....60¢ to 10¢

**Glue, Liquid Fish—**

Bottles or Cans, with Brush, 25¢ to 10¢ to 50%

**Grease, Axle—**

Common Grade.....gro. \$6.00 to \$6.50  
Dixon's Everlasting, 10-lb. pails, ea. 85¢; in boxes, 1/2 doz., 1 lb. \$1.20; 2 lb. \$2.00  
Helmet Hard Oil.....25%

**Griddles, Soapstone—**

Pike Mfg. Co.....33% to 33% to 10%

**Grinders—**

Pike Mfg. Co.:  
Hand and Foot Power, Pyko Nos. 1, 2, 3; Pyko Primo; Pyko Peerless; Pyko Spiral (foot power).....33%  
Mower Knife and Tool, \$5.00.....40¢ to 10¢  
Royal Mfg. Co.:  
Hand Power, each, Nos. 01, \$1.75; 02, \$2.25; 1A, \$2.50; 1B, \$3.25.....33%  
Foot Power, No. 10, \$5.00.....33%  
Encased Gears, No. 15, Hand Power, \$13.50; Combined Hand and Foot Power, \$15.00.....33%  
Lawn Mower Grinder, No. 40, \$3.75.....33%  
Sickle Grinder, each, No. 20, \$5.00.....33%  
Cast or Cut Gears.

**Grindstones—**

Pike Mfg. Co.:  
Improved Family Grindstones, 1/2 inch, 1/2 doz., \$2.00.....33%  
Richards Mfg. Co., Eli and Cycle, Ball Bearing, mounted.....40%

**Grips, Nipple—**

Perfect Nipple Grips.....40¢ to 10¢ to 2¢

**Halters and Ties—**

Cow Ties.....70¢ to 10¢ to 4¢  
Bridgeport Chain Co.:  
Triumph Coll and Halters, 35¢ to 2¢ to 40¢  
Brown Coll and Halters.....15¢ to 30¢ to 5¢  
Brown Cow Ties.....50¢ to 50¢ to 10¢ to 5¢  
Brown Tie Outs.....70¢ to 10¢ to 75¢ to 5¢  
Covert Mfg. Co.:  
Web.....30¢ to 2¢  
Jute Rope.....35¢  
Sisal Rope.....20¢  
Cotton Rope.....45¢  
Hemp Rope.....45¢  
Oneda Community:  
Am. Coll and Halters.....40¢ to 40¢ to 5¢  
Am. Cow Ties.....45¢ to 50¢  
Niagara Coll and Halters.....45¢ to 50¢ to 5¢  
Niagara Cow Ties.....45¢ to 50¢ to 10¢ to 5¢

**Hammers—****Handled Hammers—**

Heller's Machinists'.....65¢ to 10¢ to 65¢ to 10¢ to 10¢  
Heller's Farmers'.....40¢ to 40¢ to 10¢  
Peck, Stow & Wilcox Co.:  
Crucible Steel.....50¢  
Farriers'.....50¢  
Riveting.....50¢  
Machinists'.....50¢  
Blacksmiths'.....50¢  
Elmore Shoemakers' Hammers.....75¢  
Victor Magnetic Tack, 1/2 gro., \$7.75

**Heavy Hammers and Sledges—**

Under 3 lb., per lb., 50¢.....80¢ to 10¢  
3 to 5 lb., per lb., 40¢.....80¢ to 10¢ to 10¢  
Over 5 lb., per lb., 30¢.....80¢ to 10¢ to 10¢

**Handles—**

Agricultural Tool Handles  
Axe, Pick, &c., 60¢ to 10¢ to 60¢ to 10¢ to 5¢  
Hoe, Rake, &c., 40¢  
Fork, Shovel, Spade, &c., 40¢  
Long Handles.....40¢  
D Handles.....40¢

**Cross-Cut Saw Handles—**

Disston's Handles and Saw Tabs.....45%

**Mechanics' Tool Handles—**

Super, assorted.....gro. \$3.00 to \$3.50  
Rond Axl.....gro. \$1.65 to \$1.75  
Chisel Handles, Ass'd, per gro.:  
Tanged Firmer, Apple, \$2.40 to \$2.65; Hickory.....\$2.15 to \$2.10  
Socket Firmer, Apple, \$1.75 to \$1.95; Hickory.....1.60 to 1.75  
Socket Framing, Hickory.....\$1.60 to \$1.75

**File, assorted.....gro. \$1.30 to \$1.40**

Hammer, Hatchet, &c., 60¢ to 10¢ to 60¢ to 10¢ to 5¢

Hand Saw, Varnished, doz., 80¢

85¢; Not Varnished.....65¢ to 75¢

**Plane Handles:**

Jack, doz., 30¢; Fore, doz., 45¢

Chapin-Stephens Co.:  
Carving Tool.....30¢ to 30¢ to 10¢

Chisel.....60¢ to 60¢ to 10¢

File and Awl.....60¢ to 60¢ to 10¢

Saw and Plane.....30¢ to 30¢ to 10¢

Screw Driver.....30¢ to 30¢ to 10¢

Millers Falls Adj. and Hatchet Auger Handles.....15¢ to 10¢

Nicholson Simplicity File Handle.....15¢ to 10¢

J. L. Osgood:  
Indestructible File and Tool, 1/2 gro., No. 1, \$2.00; No. 2, \$2.50; No. 3, \$3.00; No. 4, \$3.50; No. 5, \$4.00.....gro. lots 10%

W. A. Melnick Supply Co.:  
Hammer, 1/2 doz., 12 in., \$2.00; 14 in., \$2.00; 16 in., \$2.30; 18 in., \$2.50; 20 in., \$2.70; 22 in., \$3.00; 24 in., \$3.30; 26 in., \$3.50; 30 in., \$3.80.

Sledge, 1/2 doz., oval, 30 in., \$3.80; octagon, 30 in., \$3.80; 36 in., \$4.00; octagon, 36 in., \$4.00.

Axe, 1/2 doz., 28 to 34 in., \$5.60; Adze, 1/2 doz., 36 in., \$5.80; 36 in., \$7.80.

Pick, 1/2 doz., R. R., 36 in., \$8.00; coal, 31 in., \$8.50; Hatchet, 1/2 doz., 12 to 14 in., \$2.00.

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Chicago Spring Butt Co.:  
Friction.....25%  
Oscillating.....25%  
Big Twin.....25%  
Chisholm & Moore Mfg. Co.:  
Baggage Car Door.....50%  
Elevator.....30%  
Railroad.....30%  
Cronk & Carrier Mfg. Co.:  
Loose Axle.....60¢ to 10¢  
Roller Bearing.....70%  
Griffin Mfg. Co.:  
Roller Axle, No. 10, \$12.00.....60¢ to 10¢  
Roller Bearing, No. 11, \$15.00.....60¢ to 10¢  
Roller Bearing, Ex. H., No. 22, \$18.00.....60¢ to 10¢  
Bull Dog, \$24.00.....70%  
Lane Bros. Co.:  
Pillar, Ball Bearing, \$4.00; Standard, \$3.15; No. 105, \$2.85; New Model, \$2.80; New Champion per set of 4 Hangers, complete with track.....\$2.25  
Barn Door, Standard.....60¢ to 10¢  
Hinged.....\$6.08  
Covered.....\$6.45  
Special.....\$6.45  
Trolley Hangers and track.....50%  
Lawrence Bros.:  
Cleveland.....70¢ to 7½¢  
Clipper, No. 75.....60¢  
Crown.....55¢ to 10¢  
Cyclone, No. 40.....\$6.50  
Tandem, No. 50.....\$7.50  
New York.....55¢ to 10¢  
Trolley, No. 30, 1/2 pair.....\$1.25  
McKinney Mfg. Co.:  
Roller Bearing, Nos. 1 and 2, 70%  
Anti-Friction.....60%  
Hinged Hangers, King Charn.....60%  
Richards Mfg. Co.:  
Hangers, Nos. 47, 48, 147, 247, 6045%  
Pioneer Wood Track, No. 3, \$2.25  
Roller B'g St'l Track No. 12, \$2.20  
Roller B'g St'l Track No. 13, \$2.50  
Roller B'g, Nos. 39, 41, 43, 7047½¢  
Hero, Adj. Track No. 19, 50¢ to 10¢  
Adjustable Track Tandem Trolley Track No. 16.....50¢ to 10¢  
Seal, Steel Track No. 8.....\$2.25  
Auto Adj. Track No. 22, 50¢ to 5¢  
Trolley B. D. No. 17, \$1.25; F. D. No. 120, \$2.25; No. 121, \$2.45; No. 150.....\$2.50  
Safety Underwriters F. D. No. 191.....\$2.50  
Tandem No. 41, 2½ and 3, 60¢ to 10¢  
Palace, Adjustable Track No. 132.....50¢ to 5¢  
Royal, Adjustable Track No. 122.....50¢ to 10¢  
Ives' Wood Track No. 1.....\$2.25  
Trolley B. D. No. 23.....50¢ to 10¢  
Trolley B. D. No. 24, \$1.30; No. 27, \$1.40; No. 28.....\$1.60  
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2, 7047½¢  
Anti-friction, No. 42; No. 44, sizes 2½ and 3.....60%  
Hinged Tandem No. 48.....60¢ to 5¢  
Folding Door B. B., Swivel No. 135.....40%  
Myers' Stayon Hangers.....60%

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Roller Bearing, No. 11, \$15.00.....60¢ to 10¢  
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Clipper, No. 75.....60¢  
Crown.....55¢ to 10¢  
Cyclone, No. 40.....\$6.50  
Tandem, No. 50.....\$7.50  
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Trolley, No. 30, 1/2 pair.....\$1.25  
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Roller B'g St'l Track No. 13, \$2.50  
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Anti-friction, No. 42; No. 44, sizes 2½ and 3.....60%  
Hinged Tandem No. 48.....60¢ to 5¢  
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Clipper, No. 75.....60¢  
Crown.....55¢ to 10¢  
Cyclone, No. 40.....\$6.50  
Tandem, No. 50.....\$7.50  
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Trolley, No. 30, 1/2 pair.....\$1.25  
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Special.....\$6.45  
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Clipper, No. 75.....60¢  
Crown.....55¢ to 10¢  
Cyclone, No. 40.....\$6.50  
Tandem, No. 50.....\$7.50  
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Barn Door, Standard.....60¢ to 10¢  
Hinged.....\$6.08  
Covered.....\$6.45  
Special.....\$6.45  
Trolley Hangers and track.....50%  
Lawrence Bros.:  
Cleveland.....70¢ to 7½¢  
Clipper, No. 75.....60¢  
Crown.....55¢ to 10¢

**Hitchers, Stall—**

Covert Mfg. Co., Stall Hitchers...30&amp;2%

**Hods— Coal—**

Mfg's list, price per gross:  
 Inch ..... 15 16 17 18  
 Gate, Open ..... \$35 \$39 \$43 \$46  
 Jap. Open ..... 26 28 31 35  
 Gate, Funnel ..... 43 48 52 56  
 Jap. Funnel ..... 33 36 39 43

**Masons' Etc.**

Cleveland Wire Spring Co.:  
 Steel Brick, No. 162.....each \$1.05  
 Steel Mortar, No. 158.....each \$1.35

**Hoes— Eye—**

Scovill and Oval Pattern,  
 60&100 60&100 60&100  
 Grub, list Feb. 23, 1899,  
 70&100 70&100 70&100

D. & H. Scovill.....27 1/2%  
 Am. Fork & Hoe Co. (Scovill Pat-  
 tern).....60&5%

**Handled—**

Cronk's Weeding, No. 1, \$2.00; No. 2, \$2.50  
 Star Double Bit.....\$2.50  
 American Fork & Hoe Co.:  
 Regular, Cotton.....75&10&5&2 1/2%  
 Crescent, Cultivator.....75&2 1/2%  
 Mattock, Senior.....70%  
 Mattock, Junior.....70%  
 Sprouting.....50%  
 Tobacco, Harper's.....65&15&10%  
 Warren.....55&10&5&2 1/2%  
 Ironhoe.....55&15&10%  
 Cultivator, B & C.....70&10&5&2 1/2%  
 Cultivator, B B 6 1/2.....70&10&5&2 1/2%  
 Weeding, Acme.....72&10&5&2 1/2%  
 Scuffle, Lightning.....60&5%

**Holders— Bit—**

Angular, 1/2 doz. \$21.00.....45&amp;10%

**Broom—**

Pullman Broom, 1/2 doz. \$9.00.....\$9.00

**Door—**

Bardsley's, Iron, 40%; Brass and  
 Bronze.....3%  
 Empire.....2%  
 Pullman.....2%  
 Richards Mfg. Co.: No. 117, Ever-  
 ready, 40%; Nos. 118, 119, Sure  
 Grip.....50%  
 Superior.....40%

**File and Tool—**Nicholson File Holders and File  
 Handles.....33 1/2&40%**Fruit Jar—**Triumph Fruit Jar Holder, 1/2 doz. \$2.00  
 \$18.00; 1/2 doz. \$2.00**Trace and Rein—**

Fernald Double Trace Holder, 1/2 doz.  
 pairs.....\$1.25  
 Dash Rein Holder, 1/2 doz.....\$1.25

**Hones—Razor—**Pike Mfg. Co., Belgian and Swaty,  
 50%; German.....33 1/2%**Hooks—Cast—**

Bird Cage, Reading.....50%  
 Clothes Line, Reading List.....50&5%  
 Coat and Hat Iron, Reading.....50%  
 Coat and Hat, Bronze Metal, Read-  
 ing.....33 1/2%  
 Coat and Hat, Wrightsville.....50&5%  
 Harness, Reading List.....50%

**Wire—**

Belt, Nos. 1 to 15.....75&100 80%  
 Wire O. & H. Hooks.....80 80&100  
 Parker Wire Goods Co., King.....75&100  
 Wire Goods Co.:  
 Acme, 60&10%; Chief, 75&75&10%;  
 Crown, 75&100 80%; Czar, 70%;  
 Capitol 80%; Czar Harness, 50&10%;  
 Ceiling, 75&80%.

**Miscellaneous—**

Hooks, Bench, see Staps, Bench.  
 Bush, Light, doz., \$6.20; Medium,  
 \$6.75; Heavy, \$7.65  
 Grass, best, all sizes, per doz.,  
 \$2.75 1/2 43.00  
 Grass, common grades, all sizes,  
 per doz. .... \$1.25 1/2 11.50  
 Hooks and Eyes:  
 Brass ..... 60 60&100  
 Malleable Iron ..... 70 70&100  
 Covert Mfg. Co. Gate and Scuttle  
 Hooks ..... 40%  
 Turner & Stanton Co. Cup and  
 Shoulder ..... 55&100  
 Bench Hooks—See Bench Staps.  
 Corn Hooks—See Knives, Corn.

**Hose, Rubber—**

Garden Hose, 1/2-inch:  
 Competition.....ft. 6 1/2 6 1/2  
 3-ply Guaranteed.....ft. 8 1/2 8 1/2  
 4-ply Guaranteed.....ft. 9 1/2 9 1/2  
 Cotton Garden, 1/2-in., coupled:  
 Low Grade.....ft. 8 1/2 9 1/2  
 Fair Quality.....ft. 10 1/2 11 1/2

**Irons— Sad—**

From 1/2 to 10.....lb. 2 1/2 2 1/2  
 Mrs. Potts, cents per set:  
 Nos. 50 55 60 65  
 Jap'd Caps.....55 63 86 93  
 Tin'd Caps.....91 88 1.01 98

**Bar and Corner—**Richards Mfg. Co., Bar, 60&10%;  
 Corner.....60%**Jacks, Wagons—**

Covert Mfg. Co.:  
 Auto Screw.....30&2%; Steel, 45%  
 Lockport.....50%  
 Lane's Steel.....30&5%  
 Richards' Tiger Steel, No. 130.....50&10%  
 Smith & Hemenway Co.'s.....25%

**Ladder—**

Richards Mfg. Co., Ladder Jacks.....50%

**Jointers—**

Pike Mfg. Co., Saw Jointers, \$7.00.....40%

**Knives—****Butcher, Kitchen, &c.—**

Foster Bros.' Butcher, &amp;c.....30%

**Corn—**

Columbian Cutlery Co., Wilcut,  
 Brand Knives and Hooks.....60%  
 American Fork & Hoe Co.:  
 Easy Cut, 1/2 doz., No. 10 C H.....\$2.10  
 Easy Cut, 1/2 doz., No. 10 B C H.....\$2.20  
 Acme, 1/2 doz.....\$2.35  
 Dent, 1/2 doz.....\$2.35  
 Adjustable, Serrated, 1/2 doz.....\$1.90  
 Serrated, 1/2 doz.....\$1.85  
 Yankee, No. 1 C H.....\$1.35  
 Yankee, No. 2 C H.....\$1.15

**Drawing—**

Standard List.....80&100 1/2%  
 C. E. Jennings & Co., Nos. 45, 46,  
 47, 48.....25&7 1/2%  
 Jennings & Griffin, Nos. 41, 42,  
 43, 44.....65&7 1/2%  
 Swan's.....65&7 1/2%  
 Watrous.....16%  
 L. & I. J. White.....20&5&25%

**Hay and Straw—**

Serrated Edge, per doz. \$5.00 1/2 5.50  
 Iwan's Sickle Edge.....1/2 doz. \$5.50  
 Iwan's Serrated.....1/2 doz. \$10.00

**Miscellaneous—**

Farriers' .....doz. \$2.60 1/2 3.55  
 Westenhelm's .....1/2 doz. \$3.00 1/2 3.25

**Knobs—**

Base, 2 1/2-inch, Birch or Maple,  
 Rubber Tip.....gro. \$1.25 1/2 1.10  
 Door, Mineral.....doz. 65 1/2 70 1/2  
 Door, Por. Jap'd.....doz. 70 1/2 75 1/2  
 Door, Por. Nickel.....doz. \$2.05 1/2 2.15  
 Bardsley's Wood Door, Shutters, &c. 15%

**Ladders, Store, &c.—**

Lane's Store.....25%  
 Myers' Noiseless Store Ladders.....50%  
 Richards Mfg. Co.:  
 Improved Noiseless, No. 112.....30%  
 Climax Shelf, No. 113.....50%  
 Trolley, No. 109.....50%

**Ladles, Melting—**

L. & G. Mfg. Co.'s list, Melting and  
 Plumbers'.....25%  
 P. S. & W.....40&10%  
 Reading.....50&10%

**Lamps,—**

Hammer's M. I. Hand.....45%

**Lanterns—Tubular—**

Regular, No. 0.....doz. \$1.00 1/2 4.50  
 Side Light, No. 0.....doz. \$1.25 1/2 4.75  
 Hinge Globe, No. 0.....doz. \$1.25 1/2 4.75  
 Other Styles.....40&5%

**Bull's Eye Police—**

3-inch .....\$3.75 1/2 4.00

**Latches— Thumb—**Roggin's Latches, Jap'd, with  
 Screws .....doz. 35 1/2 40 1/2**Door—**

Cronk & Carrier Mfg. Co., No. 101,  
 1/2 doz. \$2.00  
 Richards' Bull Dog, Heavy, No.  
 125 .....50&5%  
 Richards' Trump, No. 127.....\$1.50

**Leaders, Cattle—**

Small.....doz. 50 1/2 60 1/2  
 Covert Mfg. Co.:  
 Cotton, 45%; Hemp, 45%; Jute,  
 35%; Sisal, 20%.

**Lifters, Transom—**

Reading, Iron, 50&5%; Bronze  
 Metal.....33 1/2%  
 B. & E.....10%

**Lines—**

Wire Clothes, Nos. 18 19 20  
 100 feet.....\$2.30 1.95 1.75  
 75 feet.....\$1.95 1.65 1.50

Samson Cordage Works:  
 Solid Braided Chalk, Nos. 0 to 3, 40%  
 Solid Braided Masons'.....30%  
 Silver Lake Braided Chalk, No. 0,  
 \$4.00; No. 1, \$6.50; No. 2, \$7.00; No.  
 3, \$7.50.....1/2 gr. 30%  
 Masons' Lines, Shade Cord, &c.:  
 White Cotton, No. 3 1/2, \$1.50; No. 4,  
 \$2.00; No. 4 1/2, \$2.50; Colors, No. 3 1/2,  
 \$1.75; No. 4, \$2.25; No. 4 1/2, \$2.75;  
 Linen, No. 3 1/2, \$2.50; No. 4, \$3.50;  
 No. 4 1/2, \$4.50.....30%  
 Tent and Awning Lines: No. 5,  
 White Cotton, \$7.50; Drab Cotton,  
 \$2.50.....20%  
 Clothes Lines, White Cotton: 50 ft.,

\$2.75; 60 ft., \$3.25; 70 ft., \$3.75; 75  
 ft., \$4.00; 80 ft., \$4.25; 90 ft., \$4.75;  
 100 ft., \$5.25.....30%  
 Turner & Stanton Co.:  
 Solid Braided Chalk, Masons' and  
 Awning Lines.....40%  
 Clothes Lines, White Cotton.....40%  
 Shade Cord, Cotton or Linen.....30%

**Locks— Cabinet—**

Cabinet Locks.....33 1/2 1/2 5%  
 Door Locks, Latches, &c.—  
 NOTE.—Net Prices are very often made  
 on these goods.  
 Reading Hardware Co.....33 1/2%  
 R. & E. Mfg. Co.....10%

**Padlocks—**R. & E. Mfg. Co. Wrought Steel and  
 Brass.....75&10%**Sash, &c.—**

Ives' Patent:  
 Crescent.....10%  
 Automatic Gravity Metal Sash, 1/2  
 gro., \$149.58.....10%  
 Window Ventilating.....10%  
 Pullman Patent Ventilating Lock.....25%  
 Reading Sash Locks, Iron.....50%  
 Reading Sash Locks, Bronze Metal.....33 1/2%

**Machines—Boring—**Com. Up'r't, without Augers,  
 \$2.00 1/2 2.85Com. Anpl'r, without Augers,  
 \$2.25 1/2 2.50

Ford Auger Bit Co.....\$22.00  
 Jennings, Nos. 1 and 4.....25&7 1/2%  
 Millers' Falls.....5.75  
 Snell's, Upright, \$2.65; Angular, \$2.90  
 Swan's Improved.....40&10%

**Corking—**Reisinger Invincible Hand Power.....  
 1/2 doz. \$48.00**Forming, Bending, Etc—**

Royal Forming, Bending, Crimp-  
 ing and Fluting, Hand Power,  
 each, \$20.00.....40%

**Hoisting—**

Moore's Anti-Friction Chain Hoist, 30%  
 Moore's Hand Hoist, with Lock  
 Brake.....20%  
 Moore's Cyclone High Speed Chain  
 Hoist.....25%

**Ice Cutting—**

Chandler's .....12 1/2%

**Washing**

Boss Washing Machine Co.: Per doz.  
 Boss No. 1.....\$37.00  
 Boss Rotary.....\$37.00  
 Champion Rotary Banner No. 1.....\$37.00  
 Standard Champion No. 1.....\$37.00  
 Standard Perfection.....\$37.00  
 Cincinnati Square Western.....\$33.00  
 Uneeda American, Round.....\$33.60

**Mallets—**

Hickory .....45&50 1/2 50%  
 Lignumvitte .....45&50 1/2 50%  
 Timmers' Hickory and Apple-  
 wood.....doz. 45&50 1/2 50%

**Mangers, Stable—**

Sweet Iron Works.....50%

**Mats, Door—**

Acme Flexible Steel.....50%  
 Elastic Steel (W. G. Co.), new list.....50%  
 Everlasting Flexible Steel.....33 1/2%

**Mills, Coffee, &c.—**

Enterprise Mfg. Co.:  
 Coffee.....20 1/2 25%  
 Shell and Corn.....25&10%  
 Parker's Columbia and Victoria.....33 1/2%  
 Parker's Box and Side.....50&10%  
 Swift, Lane Bros. Co.....30%

**Motors, Water—**Pike Mfg. Co., Tool and Knife  
 Grinding.....33 1/2%**Mowers, Lawn—**

NOTE.—Net prices are generally quoted  
 cheap, 10-in., \$2.00; advance  
 10¢ for each size.  
 Cheap, 10-in., \$2.25; advance 15¢  
 20¢ for each size.  
 Better Grade, 10-in., \$3.00; ad-  
 vance 25¢ for each size.  
 12 14 16 18-in.  
 High Grade.....\$1.50 4.75 5.00 5.25  
 Continental.....60%  
 Great American.....70%  
 Great American Ball B'r's new list.....70%  
 Quaker City.....70%  
 Pennsylvania.....60%  
 Pennsylvania, Jr., Ball Bearing.....50&10&5%  
 Pennsylvania Golf.....50%  
 Pennsylvania Horse.....33 1/2&5%  
 Pennsylvania Pony.....40&5%

**Nails—**

Wire Nails and Brads, Miscel-  
 laneous .....85&50 1/2 85&10%  
 Cut and Wire. See Trade Report.  
 Hungarian, Finishing, Upholster-  
 ers', &c. See Tacks.

**Horse—**Jobbers' Special Brands,  
 per lb. 9¢**Picture—**

1 1/2 2 2 1/2 3 in.  
 Brass Hd, gro. .45 .55 .60 .70  
 Por. Head, gro. . . 1.10 1.10 1.10

**Upholsters—**

Brass .....30%  
 Plated .....30&10%

**Nuts— Blank or Tapped.**

Cold Punched: Off list.  
 Square .....5.40¢  
 Hexagon .....6.00¢  
 Square, C. T. & R.....5.80¢  
 Hexagon, C. T. & R.....6.60¢  
 Hot Pressed: Off list.  
 Square .....5.90¢  
 Hexagon .....6.40¢

**Oakum—**

Best .....lb. 6 1/2¢  
 U. S. Navy.....lb. 6 ¢  
 Navy .....lb. 5 ¢  
 Plumbers' Spun Oakum.....2 1/2 1/2 ¢

**Oil—**

Pike Mfg. Co., Stonoil.....40%

**Oil Tanks—See Tanks, Oil.****Oilers—**

Steel, Copper Plated.....75&10%  
 Chase or Paragon:  
 Brass and Copper.....50&10%  
 Zinc .....65&10 1/2 70%  
 Railroad .....60&10 1/2 10%  
 American Tube & Stamping Co.:  
 Spring Bottom Cans.....70&70 1/2 10%  
 Railroad Oilers, &c.....60&60 1/2 10%  
 Hero Fruit Jar Co.:  
 Spring Bottom Cans.....70&70 1/2 10%  
 Railroad Oilers, etc.....60&60 1/2 10%  
 Malleable, Hammers, Improved, Nos.  
 11, 12 and 13, 10%; Old Pattern,  
 Nos. 1, 2, 3, 4, 50%  
 Maple City Mfg. Co.:  
 Spring Bottom Cans.....70&70 1/2 10%  
 Railroad Oilers, &c.....60&60 1/2 10%

**Egg—**Hartigan Nickel Plate, 1/2 doz., \$2.00;  
 Silver Plate, \$4.00.**Packing—**Asbestos Packing, Wick and  
 Rope, any quantity.....13¢**Rubber—**

(Fair quality goods.)  
 Sheet, C. I.....11 1/2 12¢  
 Sheet, C. O. S.....11 1/2 12¢  
 Sheet, C. B. S.....12 1/2 13¢  
 Sheet, Pure Gum.....40 1/2 45¢  
 Sheet, Red.....40 1/2 50¢  
 Jenkins' '96, 1/2 lb., 80¢.....25%

**Miscellaneous—**

American Packing.....lb. 7 1/2 10 ¢  
 Cotton Packing.....lb. 16 1/2 25 ¢  
 Italian Packing.....lb. 9 1/2 10 ¢  
 Jute.....lb. 4 1/2 14 ¢  
 Russia Packing.....lb. 9 1/2 10 ¢

**Paint—**

Dixon's Silica-Graphite, in 1 gal.  
 pails and 5 gal. kegs, 25%; pack-  
 ages of larger size.....20%

**Pans— Dripping—**

Standard List.....75&amp;100 80%

**Refrigerator, Galva.—**

Inch .....12 14 16 18  
 Per doz. ....\$1.75 2.25 2.80 3.15

**Paper—Building Paper**

Asbestos Paper, ton.....\$37.50 1/2 \$40.00  
 Roll Board or Building Felt,  
 6 to 30 lb., per 100 sq. ft., 2 1/2¢  
 Roll Board or Building Felt,  
 3-32 and 1/2 in., 45 to 60 lb.,  
 per 100 sq. ft.....3 1/2¢  
 Mill Board, Sheet, 40 x 40 in.,  
 1-32 to 1/2 in.....2 1/2¢  
 Per roll.  
 Rosin Sized Sheathing: 500 sq. ft.  
 Light weight, 25 lbs. to roll,  
 48¢ 58¢  
 Medium weight, 30 lbs. to roll,  
 56¢ 70¢  
 Heavy weight, 40 lbs. to roll,  
 75¢ 78¢  
 Black Water Proof Sheathing,  
 500 sq. ft., 1 ply, 65¢; 2 ply,  
 85¢; 3 ply, \$1.10; 4 ply, \$1.25.  
 Deafening Felt, 9, 6 and 1/2 in.  
 ft. to lb., ton.....\$5.50  
 Red Rope Roofing, 250 sq. ft.  
 per roll.....\$1.75

**Tarred Paper—**

1 ply (roll 400 sq. ft.), ton,  
 \$34.00 1/2 \$38.00  
 2 ply, roll 108 sq. ft.....65¢  
 3 ply, roll 108 sq. ft.....88¢  
 Slater's Felt (roll 500 sq. ft.) 80¢

**Sand Paper and Cloth—**

Flint and Emery.....50¢ 10%  
 Garnet Paper and Cloth.....25%



**Parers—Apple—**

Goodell Co.:	
Family Bay State.....	3 doz. \$15.00
Improved Bay State.....	3 doz. \$36.00
New Lightning.....	3 doz. \$7.00
Turn Table.....	3 doz. \$6.00
White Mountain.....	each \$7.50
Bonanza Improved.....	each \$7.50
Dandy.....	each \$10.00
Eureka Improved.....	each \$20.00
New Century.....	each \$20.00
Reading Hardware Co.:	each \$30.00
Advance.....	3 doz. \$4.00
Baldwin.....	3 doz. \$4.00
Reading.....	3 doz. \$3.25
Reading.....	3 doz. \$6.25

**Orange—**

Goodell Co., Success.....	each \$20.00
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**Potato—**

Saratoga.....	3 doz. \$7.00
White Mountain.....	3 doz. \$6.00

**Picks and Mattocks—**

List.....	75¢ to 10%
Cronk's Handled Garden Mattock.	3 doz., \$3.00.....33%

**Pins, Escutcheon—**

Brass.....	50¢ to 50¢ to 10%
Iron.....	60¢ to 60¢ to 10%

**Pipe, Cast Iron Soil—**

Eastern Prices:	
Standard, 2-6 in.....	65%
Extra Heavy, 2-6 in.....	75%
Fittings, Standard and Heavy.....	80%

**Pipe, Merchant—**

Carloads to Consumers:	
Steel.....	%
Iron.....	%
Blk. Galv. Bk. Galv.....	%
1/2 and 1/4 in.....	%
1/2 in.....	%
1 in.....	%
1 1/2 in.....	%
2 in.....	%
2 1/2 in.....	%
3 in.....	%
3 1/2 in.....	%
4 in.....	%
4 1/2 in.....	%
5 in.....	%
5 1/2 in.....	%
6 in.....	%
6 1/2 in.....	%
7 in.....	%
7 1/2 in.....	%
8 in.....	%
8 1/2 in.....	%
9 in.....	%
9 1/2 in.....	%
10 in.....	%
10 1/2 in.....	%
11 in.....	%
11 1/2 in.....	%
12 in.....	%

**Pipe, Vitrified Sewer—**

Carload lots.	
Standard Pipe and Fittings, 3 to 24 in., f.o.b. factory:	
First-class.....	85%
Second-class.....	87%

**Pipe, Stove—**

Per 100 joints.	
C. L. L. C. L.	
Wheeling Corrugating Co.'s Nested:	
5 in., Uniform Color.....	\$5.90
6 in., Uniform Color.....	7.40
7 in., Uniform Color.....	7.40

**Planes and Plane Irons—****Wood Planes—**

Bench, First qual.....	30¢ to 30¢ to 5%
Bench, second qual.....	30¢ to 30¢ to 5%
Molding.....	25¢ to 25¢ to 5%
Chapin-Stephens Co.:	
Bench, First Quality.....	30%
Bench, Second Quality.....	40%
Molding and Miscellaneous.....	25%
Toy and German.....	30%
Union.....	60%

**Iron Planes -****Plane Irons—**

Wood Bench Plane Irons.....	25%
Buck Bros.....	30%
Chapin-Stephens Co.....	25%
Union.....	50%
L. & I. J. White.....	20¢ to 25%

**Planters, Corn, Hand—**

Kohler's Eclipse.....	3 doz. \$7.50
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**Plates—**

Felcoe.....	10 lb. 3¢ to 4¢
Avery Stamping Co.:	
Standard Wrot. Steel Felcoe Plates in 100 lb kegs, per 100 lb, 1/4 in. to 1 1/4 in., \$4.00 net; 1 1/4 in. to 2 in., inclusive, \$3.75 net.	

**Steel Pipe Hook—**

Never-Break.....	75¢ to 10%
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**Pliers and Nippers -**

Button Pliers.....	75¢ to 75¢ to 10%
Gas Burner, per doz., 5 in., \$1.25	
Gas pipe.....	7 8 10 12 in.
Acme Nippers.....	50¢ to 5%
Cronk & Carrier Mfg. Co.:	
American Button.....	80%
Improved Button.....	75¢ to 10%
Cronk's.....	60%
No. 3 Linemen's.....	50%
Stub's Pattern.....	45%
Combination and others.....	33%
Elmore Tool Mfg. Co.:	
Gas Pliers.....	70%
Wire and Cutting Pliers.....	75%
Heller's Farriers' Nippers, Pincers and Tools.....	40¢ to 40¢ to 10%

P. S. & W. Timmers' Cutting Nippers.....	20%
Utica Drop Forge & Tool Co.:	
Pliers and Nippers, all kinds.....	40%

**Plumbs and Levels—**

Chapin-Stephens Co.:	
Plumbs and Levels.....	30¢ to 30¢ to 10%
Chapin's Imp. Brass Cor. 40¢ to 40¢ to 10%	
Pocket Levels.....	30¢ to 30¢ to 10%
Extension Sights.....	30¢ to 30¢ to 10%
Machinists' Levels.....	40¢ to 40¢ to 10%
Diston & Sons:	
Shafting Levels.....	60¢ to 10%
Pocket Levels.....	60¢ to 10%
Plumbs and Levels.....	60¢ to 10%
Track Level and Gauge.....	60¢ to 10%
Woods' Extension.....	33%

**Points, Glaziers'—**

Bulk and 1-lb. papers.....	7b. 9¢
1/2-lb. papers.....	7b. 9¢
1/4-lb. papers.....	7b. 10¢

**Police Goods—**

Manufacturers' Lists.....	25¢ to 25¢ to 5%
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**Polish—Metal, Etc—**

Ladd Co.:	
Putzade Liquid, 3/4 gro., 1/2 pts., \$12.00; 1 pts., \$20.00; 1 qts., \$40.00; 3/4 doz., 1/2 gal., \$6.35; 1 gal., \$12.00.	
Prestoline Liquid, No. 1 (1/4 pt.), 3/4 doz., \$3.00; No. 2 (1 q.), \$3.00; 40%	
Prestoline Paste.....	40%
George William Hoffman:	
U. S. Metal Polish Paste, 3 oz. boxes, 50¢ doz.; 3/4 gro. \$4.50; 1/2 lb boxes, 50¢ doz.; 1 lb boxes, 50¢ doz., \$2.25.	
U. S. Liquid, 8 oz. cans, 50¢ doz., \$1.75.	
Barkeepers' Friend Metal Polish, 50¢ doz., \$1.75.	

**Stove—**

Black Eagle Benzine Paste, 5 lb cans, 50¢ doz.; 1/2 pt. cans, 50¢ doz., 75¢ doz.	
Black Jack Paste, 1/2 lb cans, 50¢ doz., \$3.00.	
Black Kid Paste, 5 lb cans, each, \$0.65.	
Ladd's Black Beauty Liquid, per 100 tin.....	\$6.75
Joseph Dixon, 3/4 gr. \$3.75.....	10%
Dixon's Plumbago.....	10%
Fireside.....	10%
Gem, 3/4 gr. \$1.50.....	10%
Japanese.....	3/4 gr. \$3.50
Jet Black.....	3/4 gr. \$3.50
Peerless Iron Enamel, 10 oz. cans, 50¢ doz., \$1.50	

**Window Polish—**

Benj. P. Forbes:	
Glasbright, No. 2, gal pails, 50¢ doz., \$24.00; each, \$2.50; 1 lb cans, each, 75¢ doz.	
Glasbright Powder, bbis., 50¢ doz., \$2.00	

**Peppers, Corn—**

1 qt. Square.....	doz. \$0.80; gro. \$3.75
1 qt. Round.....	doz. \$0.80; gro. \$4.00
1 1/2 qt. Square.....	doz. \$1.20; gro. \$12.00
2 qt. Square.....	doz. \$1.50; gro. \$15.00

**Pots, Glue—**

Enameled.....	40%
Tinned.....	30¢ to 10%

**Powder—**

Black Sporting:	
Kegs (25 lb.).....	\$5.00 to \$5.50
Half Kegs (12 1/2 lb.).....	\$2.75 to \$3.00
Quarter Kegs (6 1/4 lb.).....	\$1.50 to \$1.65
Canisters, pounds.....	25
Canisters, 1/2 pounds.....	15
Canisters, 1/4 pounds.....	12

NOTE.—Prices vary according to territory.

**Presses—****Fruit, Wine and Jelly—**

Enterprise Mfg. Co.....	20¢ to 25%
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**Seal Presses—**

Morrill's No. 1, 3/4 doz., \$20.00, 50%;	
Morrill's Pocket, \$20.00.....	50%

**Pruning Hooks and Shears—****See Shears.****Pullers, Nail, Etc.—**

Elmore Tool Mfg. Co.:	
Drop Forged Tack Pullers.....	10%
Nail Pullers.....	40%
Miller's Falls, No. 3, 3/4 doz., \$12.00.	
Morrill's No. 1, Nail Puller, 50¢ doz.	
Pearson Spike Puller, each, \$15.00, 50%.	
The Scranton Co., Case Lots:	
No. 2B (large).....	\$5.50
No. 3B (small).....	\$5.00

**Pulleys, Single Wheel—**

Inch.....	1 1/2 1 3/4 2 3
Acting or Tackle,	
doz.....	\$0.30 35 60 1.05
Hay Fork, Sidel or Solid Eye,	
doz., 1/4 in., \$1.25; 5 in., \$1.55	
Inch.....	2 2 1/4 2 1/2
Hot House, doz.....	\$0.65 85 1.20
Inch.....	1 1/4 1 1/2 1 3/4 2

Screw, doz.....	\$0.16 10 23 30
Inch.....	2 2 1/4 2 1/2
Side, doz.....	\$0.25 40 55 60
Inch.....	1 1/4 1 1/2 2 1/2

**Sash Pulleys—**

Common Frame; Square or Round End, per doz., 1 1/4 and 2 in.....	17¢ to 20¢
Auger Mortise, no Face Plate, per doz., 1 1/4 and 2 in.....	20¢ to 21¢
Acme, No. 35, 1 1/4 in., 19¢; 2 in., 20 1/2¢	
American Pulley Co.:	
Wrought Steel American Plain Axle.....	50¢ to 10%
Wrought Steel, Eagle, 3/4 doz., 1 1/4 in., 17¢; 2 in., 20¢; 2 1/2 in., 27¢	
Top Notch, Electrically Welded, Nos. 3 and 4, 3/4 doz.....	19¢
Common Sense.....	3/4 doz. 20¢
Merit, 3/4 doz., 2 1/4 in.....	37¢
Fox-All-Steel, Nos. 3 and 7, 2 in.....	
Grand Rapids All Steel Noiseless.....	50%
Niagara, No. 25, 1 1/4 in., 19¢; 2 in., 20 1/2¢	
No. 26, Troy, 1 1/4 in., 14 1/2¢; 2 in., 16 1/2¢	
Star, No. 26, 1 1/4 in., 19¢; 2 in., 20 1/2¢	
Tackle Blocks—See Blocks.	

**Pumps—**

Cistern.....	60%
Pitcher Spout.....	75¢ to 10¢ to 50%
Wood Pumps, Tubing, ds.....	50%
Barnes Mfg. Co.:	
Dbt. Acting (low list).....	50%
Pitcher Spout.....	80%
Contractors' Rubber Diaphragm, No. 2 B. & L. Block Co.....	\$16.00
Daisy Spray Pump.....	3/4 doz. \$6.50
Goulds Mfg. Co.:	
Double-Acting Thresher Tank.....	\$5.00
Diaphragm No. 3, Side Suction.....	\$14.50
Empire, Advance, Seneca, D. A. Shallow and Deep Well (low list).....	50%
Spraying and Whitewashing.....	\$2.45
F. E. Myers & Bros.:	
Pumps (low list), Power Pumps, Spray Pumps.....	50%

**Pump Leathers—**

Plunger and Valve Leathers—Per gro.:	
No.....	1 2 3 4 5 6 7 8 9 10
1.....	\$5.00 6.00 7.00 8.00
Cup Leathers—Per 100:	
Inch.....	2 1/2 3 3 1/2 4
1.....	\$5.00 7.00 9.00 12.00

**Punches—**

Saddlers' or Drive, good, doz. 50¢ to 75¢	
Spring, single tube, good qual. 100.....	\$1.75
Revolving (4 tubes).....	doz. \$3.50
Bemis & Call Co.'s Cast St'l Drive.....	50%
Machinists' Center.....	40%
Timmers' Solid, 50%; Prick.....	50%
Morrill's Nos. 1A, 1A, 1B, 1C, 1D, \$15.00.....	50%
Hercules, 1 die, each \$5.00.....	50%
Niagara Hollow Punches.....	40%
Niagara Solid Punches.....	55%
Timmers' Hollow, P. S. & W. Co. 25% Timmers' Solid, P. S. & W. Co., 40¢ doz., \$1.40.....	40% to 10%

**Rail—Barn Door, &c.—**

Sliding Door, Painted Iron, 2 1/2 in., 1 lb., 36¢.....	30%
Sliding Door, Wrought Brass, 1 1/2 in., 1 lb., 36¢.....	30%
Cronk's:	
Double Braced Steel Rail, 3/4 ft. 2 1/4¢	
O. N. T. Rail.....	2 1/4¢
Grimm's:	
xxx, 100 ft., 1 x 3-16 in., \$3.25;	
1 1/4 x 3-16 in., \$3.75.	
Hinged Hanger, 100 ft., 1 x 3-16 in., \$3.50; 1 1/4 x 3-16 in., \$4.00.	
Lane's:	
Hinged Track, 100 ft.....	\$3.45
O. N. T., 100 ft., 1 in., \$3.12 1/2;	
1 1/4 in., \$3.45; 1 1/2 in., \$4.00.	
Standard, 1 1/4 in.....	100 ft. \$4.00
Lawrence Bros.:	
1 x 3-16 in., 100 ft., \$7.50; 1 1/4 x 3-16 in., \$8.75.....	55¢ to 7 1/2¢
Trolley, No. 301, 3/4 ft.....	9¢
McKinney's:	
Hinged Hanger Track, 3/4 ft., 11¢	
1 x 3-16 Track.....	60¢ to 5%
Myers' Stayon Track.....	55¢ to 45%
Richards Mfg. Co.:	
Common, 1 x 3-16 in., \$3.00; 1 1/4 x 3-16, \$3.25; 1 1/2 x 3-16, \$3.50.	
Special Hinged Hanger Rail.....	60¢ to 10%
Lag Screw Rail, No. 65.....	50%
Gauge Trolley Track, 3/4 ft. No. 31, 9¢; No. 32, 14¢; No. 33, 20¢.	
No. 50.....	60¢ to 10%
No. 61, \$3.00; 62, \$3.25; 63, \$3.50; 64, \$4.00; 65, \$3.25; 66, \$3.50; 67, No. 1, \$3.25; 68, No. 2, \$3.50.	

**Rakes—**

American Fork & Hoe Co.:	
Lawn, 3/4 doz., No. 24, \$2.50; No. 25.....	\$2.25

Cronk's:	
Steel Garden: Champion, 3/4 doz., 12-tooth, \$3.75; 14-tooth, \$4.00; 16-tooth, \$4.25; Ideal, 3/4 doz., 12-tooth, \$3.00; 14-tooth, \$3.30; 16-tooth, \$3.60.	
Victor, 12-tooth, \$2.75; 14-tooth, \$2.50; 16-tooth, \$2.25.	
Queen City Lawn, 3/4 doz., 20 teeth, \$2.85; 24, \$3.00.....	net
Anticlog Lawn, 3/4 doz.....	\$4.00
Malleable Garden.....	70¢ to 10%
Ideal Steel Garden, 3/4 doz., 12 teeth, \$15.00; 14, \$16.00; 16, \$18.00.....	80%
Kohler's:	
Jumbo Lawn, 36-tooth.....	3/4 doz. \$5.00
Lawn Queen, 20-tooth.....	3/4 doz. \$2.65
Lawn Queen, 24-tooth.....	3/4 doz. \$2.75
Paragon, 20-tooth.....	3/4 doz. \$2.40
Paragon, 24-tooth.....	3/4 doz. \$2.50
Steel Garden, 14-tooth.....	3/4 doz. \$2.40
Malleable Garden, 14-tooth, 3/4 doz.....	\$1.75 to 2.00

**Rasps, Horse—**

Disston's.....	75%
Heller Bros.....	70¢ to 50¢ to 10¢ to 5%
Liveright Bros.' Gold Medal.....	70%
McCaffrey's American Standard.....	60¢ to 10%
New Nicholson.....	70¢ to 10¢ to 75%
See also Files.	

**Razors—**

Fox Razors, 3/4 doz., No. 42, \$24.00; No. 44, \$20.00; No. 45, \$18.00.	
Platina, \$36.00.	

**Reels, Fishing—**

Hendryx:	
M 6, Q 6, A 6, B 6, M 9 1/4, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo, Nickel Populo.....	20%
Aluminum, German Silv., Bronze, 25% 1240 N, 124 N.....	20%
3004 N, 66 N, 6 RM, G 9.....	25%
4 N, 6 PN, 24 N, 26 PN.....	20%
2904 P, 33 1/2%, 2904 PN, 33 1/2%;	
6924 N, 33 1/2%; 7204 N, 33 1/2%;	
002904 PN, 33 1/2%; 802 N, 33 1/2%;	
986 PN, 2904 N, 971 PN.....	25%
5009 PN, 5009 N, 971 PN.....	25%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR.....	20%
304 P, 304 PN, 00304 P, 00304 PN, 33 1/2%.	

**Registers—List July 1, 1903.**

Japanned, Electroplated and Bronzed.....	70%
White Porcelain Enamel.....	50¢ to 10%
Solid Brass or Bronze Metal.....	40%

**Revolvers—**

**Sisal, Tarred, Medium Lath**  
Yarn:  
Pure .....lb. 6¢ @ 7¢  
**Cotton Rope:**  
Best, 1/4-in. and larger. 16¢ @ 20¢  
Medium, 1/4-in. and larger. 15¢ @ 16¢  
Common, 1/4-in. and larger. 7¢ @ 8¢  
In coils, 1/2¢ advance.

**Jute Rope:**  
Rope, No. 1, 1/4-in. and up  
lb. ....5¢ @ 5 1/2¢

**Wire Rope—**  
Galvanized .....47¢ @ 51 1/2¢  
Plain .....55¢ @ 59 1/2¢

**Ropes, Hammock—**  
Covert Mfg. Co.:  
Jute, 3/8"; Sisal.....20%

**Rules**  
Boxwood .....60¢ @ 57¢  
Ivory .....25¢ @ 57¢

**Chapin-Stephens Co.:**  
Boxwood .....60%  
Flexfold .....40%  
Ivory .....50¢ @ 50 1/2¢  
Miscellaneous .....55%  
Stephens' Combination.....55%  
Stationers' .....50¢ @ 50 1/2¢

**Keuffel & Esser Co.:**  
Folding, Wood.....35¢ @ 10%  
Folding, Steel.....33¢ @ 10%  
Lufkin's Steel.....50¢ @ 10%  
Lufkin's Lumber.....50¢ @ 10%  
Upson Nut Co.:  
Upson Nut Co., Boxwood.....60¢ @ 5%

## Saws—

Atkins':  
Circular .....45%  
Band .....50¢ @ 50 1/2¢  
Butcher Saws.....50%  
Cross Cuts.....35%  
One-Man Cross Cut.....40%  
Narrow Cross Cut.....50%  
Hand, Rip and Panel.....35¢ @ 5%  
Miter Box and Compass.....45%  
Mulay, Mill and Drag.....40%  
Wood Saws.....40¢ @ 10%

**Chapin-Stephens Co.:**  
Turning Saws and Frames. 30¢ @ 30 1/2¢  
Diamond Saw & Stamping Works:  
Sterling Kitchen Saws.....30¢ @ 10 1/2¢

**Diaston's:**  
Circular, Solid and Ins'ted Tooth. 50%  
Band, 2 to 18 in. wide.....60%  
Band, 1/4 to 1 1/2.....60%  
Crosscuts.....45%  
Narrow Crosscuts.....50%  
Mulay, Mill and Drag.....40%  
Framed Woodsaws.....25%  
Wood saw Holes, Tinned.....15%  
Hand Saws, Nos. 12, 99, 9, 16, d100,  
D8, 120, 76, 77, 8.....25%  
Hand Saws, Nos. 7, 107, 107 1/2, 3, 1,  
0, 00, Combination.....30%  
Compass, Key Hole, &c.....25%  
Hand Ice Saws.....45%  
Butcher Saws and Blades.....30%

**C. E. Jennings & Co.'s:**  
Back Saws.....18%  
Butcher Saws.....25¢ @ 7 1/2¢  
Compass and Key Hole Saws.....33¢ @ 7 1/2¢  
Framed Wood Saws.....25¢ @ 7 1/2¢  
Hand Saws.....12%  
Wood Saw Blades.....33¢ @ 7 1/2¢

**Millers Falls:**  
Butcher Saws.....15¢ @ 10%  
Star Saw Blades.....15¢ @ 10%

**Massachusetts Saw Works:**  
Victor Kitchen Saws.....40¢ @ 50¢  
Butcher Saws Blades.....35¢ @ 40%  
Peace & Richardson's Hand Saws. 30%

**Simonds':**  
Circular Saws.....45%  
Crescent Ground Cross Cut Saws. 30%  
One-Man Cross Cuts.....40%  
Gang Mill, Mulay and Drag Saws. 40%  
Hand Saws.....50%  
Back Saws.....25¢ @ 7 1/2¢  
Butcher Saws.....25¢ @ 7 1/2¢  
Hand Saws.....25¢ @ 7 1/2¢  
Hand Saws, Bay State Brand.....45%  
Compass, Key Hole, &c.....25¢ @ 7 1/2¢  
Wood Saws.....40¢ @ 7 1/2¢

**Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws.....50%**

**Hack Saw Blades and Frames—**

Atkins' Hack Saw Blades A A A.....25%  
Diaston's:  
Concave Blades.....25%  
Chromol Blades.....35%  
Hack Saw Frames.....30%  
Simonds, 35%; Bay State, 40%;  
Culley .....35%

**C. E. Jennings & Co.'s:**  
Hack Saw Frames, Nos. 175, 180.....40¢ @ 7 1/2¢  
Hack Saws, Nos. 175, 180, complete.....40¢ @ 7 1/2¢

**Goodell's Hack Saw Blades.....40¢ @ 10%**  
Griffin's Hack Saw Frames. 35¢ @ 5 1/2¢  
Griffin's Hack Saw Blades.....35¢ @ 5 1/2¢  
Griffin Co. Hack Saw Blades.....50%  
Star Hack Saws and Blades.....15¢ @ 10%  
Sterling Hack Saw Blades. 30¢ @ 10 1/2¢  
Sterling Hack Saw Frames. 30¢ @ 10 1/2¢  
Sterling Power Hack Saw Machines,  
each, No. 1, \$25.00; No. 2, \$30.00. 10%  
Victor Hack Saw Blades.....20%  
Victor Hack Saw Frames.....40%

**Scroll—**

Barnes, No. 7, \$15.....25%  
Barnes' Scroll Saw Blades.....40%  
Barnes' Velocipede Power Scroll Saw,  
without boring attachment, \$18.....20%  
Lester, complete, \$10.00.....15¢ @ 10%  
Rogers, complete, \$3.50 and \$4.00.....15¢ @ 10%

## Seals—

Union Platform, Plain. \$2.10 @ 2.20  
Union Platform, Stpd. \$2.30 @ 2.50  
Chatillon's:  
Eureka .....25%  
Favorite .....40%  
Grocers' Trip Seals.....50%  
Reading Hardware Co.....50¢ @ 5%  
The Standard Portables.....40%  
The Standard R. R. and Wag-

## Scrapers—

Chapin-Stephens Co., Box. 30¢ @ 30 1/2¢  
Richards Mfg. Co., Foot.....60%

## Screws—Bench and Hand

Bench, Iron, doz., 1 in., \$2.50 @  
2 1/2"; 1 1/2", \$3.00 @ 3.25; 1 3/4",  
\$3.50 @ 3.75  
Bench, Wood.....80¢ @ 10%  
Hand, Wood.....70¢ @ 10% @ 10 1/2¢ @ 10%  
Chapin-Stephens Co., Hand.....70¢ @ 10% @ 10 1/2¢ @ 10%

**Coach, Lag and Hand Rail—**  
Lag, Cone Point.....80¢ @ 10%  
Coach, Gimlet Point.....80¢ @ 5%  
Hand Rail.....70¢ @ 10% @ 7 1/2%

**Jack Screws—**  
Standard List.....70¢ @ 10% @ 7 1/2%  
Millers Falls.....50¢ @ 10%  
Swett Iron Works.....70¢ @ 7 1/2%

**Machine—**  
Cut Tread, Iron, Brass or  
Bronze:  
Flat Head or Round Head,  
50¢ @ 50 1/2¢ @ 10%  
Fullister Head.....40¢ @ 10 1/2¢  
Rolled Thread, F. H. or R. H.,  
Iron.....75¢ @ 10%  
F. H. or R. H., Brass, Nos.  
8 to 14.....65¢ @ 10%

**Set and Cap—**  
Set (Iron).....75¢ @ 10 1/2¢ @ 10%  
Set (Steel), net advance over  
Iron.....25%  
Sq. Hd. Cap.....70¢ @ 10 1/2¢ @ 10%  
Hex. Hd. Cap.....70¢ @ 10 1/2¢ @ 10%  
Rd. Hd. Cap.....50¢ @ 7 1/2%  
Fullister Hd. Cap.....60¢ @ 7 1/2%

**Wood—**  
List July 23, 1903.

Flat Head, Iron.....87¢ @ 50¢ @ 10%  
Round Head, Iron.....85¢ @ 50¢ @ 10%  
Flat Head, Brass.....80¢ @ 50¢ @ 10%  
Round Head, Brass.....77¢ @ 50¢ @ 10%  
Flat Head, Bronze.....75¢ @ 50¢ @ 10%  
Round Head, Bronze.....72¢ @ 50¢ @ 10%  
Drive Screws.....87¢ @ 50¢ @ 10%

**Scythes—** Per doz.

Plain Grass, Cutting Edge Pol-  
ished.....\$6.25 @ \$6.50  
Clipper, Bronzed Web. \$0.50 @ \$0.75  
Solid Steel, Web and Backs Pol-  
ished.....\$7.00 @ \$7.25  
Bush, Weed and Bramble,  
Painted.....\$6.50 @ \$6.75  
Grain, Painted, Cutting Edge  
Polished.....\$8.25 @ \$8.50  
Clipper Grain, Bronze Web.  
\$8.50 @ \$8.75

**Seeders, Raisin—**

Enterprise .....25¢ @ 30%

**Sets—Awl and Tool—**

Fray's Hollow Tool Handles, Nos. 1,  
\$12; 2, \$16; 3, \$12.....50%  
Millers Falls Adj. Tool Handles, No.  
1, \$12; No. 4, \$12; No. 5, \$18.....20¢ @ 10%

**Garden Tool Sets—**

American Fork & Hoe Co.:  
Rake, Shovel and Hoe, #10z, sets,  
No. 3 P F.....\$7.50

**Sets, Nail—**

Octagon .....gro. \$3.50 @ 3.75  
Buck Bros.....27 1/2%  
Elmore Tool Mfg. Co.....30%  
Mayhew's.....\$9.00  
Snell's Corrugated, Cup Pt.....40¢ @ 10%  
Snell's Knurled, Cup Pt.....40¢ @ 10%  
Victor Knurled, Cup Pt.....\$9.00

**Rivet—**

Regular List.....75¢ @ 75 1/2¢ @ 10%

**Saw—**

Atkins':  
Criterion .....40%  
Adjustable .....40%  
Diaston's Star, Monarch and Tri-  
umph.....30%  
Giant Royal Cross Cut.....\$4.00  
Morrill's No. 1.....\$15.00  
Nos. 3 and 4, Cross Cut.....\$20.00  
No. 5, Mill.....\$30.00  
Nos. 10, 11, 95.....\$15.00  
No. 1 Old Style.....\$10.00  
Special.....\$16.25

Royal, Hand.....\$9.00  
Seymour Smith & Son's.....65%  
Taintor Positive.....\$9.00

**Sharpeners, Knife—**

Pike Mfg. Co.:  
Fast Cut Pocket Knife Hones,  
#1 doz.....\$1.50  
Mounted Kitchen Sand Stone,  
#1 doz.....\$1.50  
Natural Grit Carving Knife  
Hones, #1 doz.....\$3.00  
Quick Cut Emery Carving  
Knife Hones, #1 doz.....\$1.50  
Quick Edge Pocket Knife  
Hones, #1 doz.....\$2.50

## Lawn Mower—

Pike Mfg. Co., 12, 14, 16, 18 and 20  
in., doz., \$6.00.....33 1/2%

## Shaves, Spoke—

Iron .....doz. \$1.25  
Wood .....doz. \$2.00  
Chapin-Stephens Co.....30¢ @ 30 1/2%  
Millers Falls Co., #1 doz., \$9.00. 15¢ @ 10%  
Seymour Smith & Son's.....40%

## Shears—

Cast Iron... 7 8 9 in.  
Best .....\$16.00 18.00 20.00 gro.  
Good .....\$13.00 15.00 17.00 gro.  
Cheap .....\$5.00 6.00 7.00 gro.

**Straight Trimmers, &c.:**  
Best quality Jap.....70¢ @ 10 1/2%  
Best Quality Nickel.....60¢ @ 10 1/2%  
Tailors' Shears.....40¢ @ 10 1/2%  
Acme Cast Shears.....40¢ @ 10 1/2%  
Columbian Cutlery Co.:  
Sheep, 1900 list.....30¢ @ 10 1/2%  
Grass .....50¢ @ 10%  
Horse or Mule.....50¢ @ 10%  
W. H. Compton Shear Co.:  
Japan Handles, Nickel Blades,  
60¢ @ 10 1/2%  
Full Nickel.....50¢ @ 10 1/2%  
J. Wiss & Sons Co.:  
Best Quality Jap'd.....60¢ @ 10%  
Best Quality Nickeld.....50¢ @ 10%  
Tailors' .....25%

**Tinners' Snips—**

Steel Blades.....20¢ @ 20 1/2¢ @ 10%  
Steel Laid Blades.....50¢ @ 10%  
Acme Cast Snips.....40¢ @ 15 1/2%  
W. H. Compton Shear Co., Forged  
Steel Handles.....35%  
Forged Handles, Steel Blades, Sam-  
son.....40¢ @ 10 1/2%  
Jennings & Griffin Mfg. Co.'s #4 to  
10 in.....33 1/2¢ @ 7 1/2%  
Niagara Snips.....40%  
P. S. & W. Forged Handles.....25%  
J. Wiss & Sons Co.:  
Wiss Forged Steel.....25%

**Pruning Shears—**

Columbian Cutlery Co.:  
Hedge, Wilcut Brand.....60¢ @ 10%  
Lawn and Border, Wilcut Brand.....60¢ @ 10%  
W. H. Compton Shear Co., Dropped  
Forged Steel.....35%  
Cronk's Hand Shears.....33 1/2%  
Cronk's Wood Handle Shears.....33 1/2%  
Diaston's Combined Pruning Hook  
and Saw, 20 doz., \$18.00.....25%  
Diaston's Pruning Hook only, 30  
doz., \$12.00.....25%  
J. T. Henry Mfg. Co.:  
Pruning Shears, all grades.....40%  
P. S. & W. Co.....40%  
Seymour Smith & Son's:  
Standard Tree Pruners.....75¢ @ 10%  
Wood Handle Pruning Shears.....40%

**Sheaves—Sliding Door—**

Reading List.....40%  
R. & E. list.....15%

**Sliding Shutter—**

Reading List.....40%  
R. & E. list.....15%

**Shells—Shells, Empty—**

Brass Shells, Empty:  
Climax, 10 and 12 gauge.....60¢ @ 5%  
Club, Rival, 65¢ @ 5%; First Quality,  
60¢ @ 5%

**Paper Shells, Empty:**

New Rapid, 10, 12, 16 and 20 gauge,  
25¢ @ 10%  
Climax, 10 and 12 gauge; Arrow,  
10, 12, 16 and 20 gauge; Leader  
grade.....25¢ @ 5%  
New Club, 10 and 12 gauge, Rival  
Grade.....25%  
New Climax, DeLancey, 10, 12, 14,  
16 and 20 gauge; Climax, 14, 16  
and 20 gauge.....20%  
Nitro Club, 10, 12, 16 and 20 gauge;  
New Club, 14, 16 and 20 gauge;  
Repeater Grade.....20%

**Shells, Loaded—**

Loaded with Black Powder.....40%  
Loaded with Smokeless Powder,  
medium grade.....40¢ @ 5%  
Loaded with Smokeless Powder,  
high grade.....40¢ @ 10 1/2¢ @ 10%  
Union Metallic Cartridge Co.:  
New Club, Black Powders.....40%  
Nitro Club, Smokeless Powders. 40¢ @ 5%  
Arrow, Smokeless Powders. 40¢ @ 10 1/2%  
Winchester:  
Smokeless Repeater Grade.....40¢ @ 5%  
Smokeless Leader Grade.....40¢ @ 10 1/2%  
Black Powder.....40%

**Shingles, Metal—Per Sq.**

Wheeling Corrugating Co.:  
Dixie, 14 x 20 in.....\$4.05 \$5.05  
Dixie, 12 x 14 in.....4.25 5.45  
Dixie, 7 x 10 in.....5.25 6.79

**Shoes, Horse, Mule, &c.—**

F. & B. Pittsburgh:  
Iron .....per keg \$4.10  
Steel .....per keg \$5.65  
Burden's, all sizes.....per keg \$3.98

**Shot—**

25-lb. bag.  
Drop, up to B.....\$1.60  
Drop, B and larger.....1.85  
Buck .....1.85  
Chilled .....1.85  
Dust .....\$3.00

**Shovels and Spades—**

Association List.....40¢ @ 7 1/2¢ @ 10 1/2%  
Avery Stamping Co.....40%

## Snow Shovels—

Long Handle.....\$2.50 @ \$2.75  
Wood and Mall, D Handle.  
\$2.65 @ \$2.90

**Sieves and Sifters—**

Hunter's Imitation, gro.....\$9.50  
Hunter's Genuine, per gro.....\$12.00

**Sieves, Seamless Metallic**

Per dozen.  
Mesh .....1 1/2 16 18 20  
Iron Wire.....\$1.05 1.05 1.10 1.20  
Tinned Wire.....\$1.15 1.15 1.20 1.30

**Sieves, Wooden Rim—**  
Nested, 10, 11 and 12 Inch.  
Mesh 18, Nested.....doz. \$9.90 @ 9.95  
Mesh 20, Nested.....doz. \$11.00 @ 11.05  
Mesh 2 1/2, Nested.....doz. \$1.50 @ 1.50

**Sinks, Cast Iron—**

Painted, Standard List:  
12 x 12 to 22 x 36 in.....60%  
20 x 24 to 24 x 50 in.....50%  
24 x 60 to 24 x 120 in.....30%  
Barnes' low list.....60%  
NOTE—There is not entire uniformity  
in lists used by jobbers.

**Steel—**

Steel Sinks, L. & G. list.....60%

**Skeins, Wagon—**

Cast Iron.....70¢ @ 70¢ @ 10%  
Steel .....35¢ @ 40%

**Slates, School—**

Factory Shipments.  
"D" Slates.....50¢ @ 50¢ @ 10%  
Eureka, Unexcelled Notelass.....60¢ @ 7 tens.  
Victor A, Notelass. 60¢ @ 7 tens @ 5%

**Sleds—**

Little Giant Folding, #1 doz.....\$12.00

**Snaps, Harness—**

German .....40¢ @ 40¢ @ 10%  
Covert Mfg. Co.:  
Derby, 25%; Yankee, 30¢ @ 2%; Yankee  
Roller, 30¢ @ 2%  
High Grade, 40%; Trojan.....40%  
Jockey .....25%

**Snaths—**

Grass Scythe.....50¢ @ 50¢ @ 5%

**Spoons and Forks—**

**Silver Plated—**

Good Quality.....50¢ @ 10¢ @ 60¢ @ 5%  
Cheap .....60¢ @ 60¢ @ 10%  
International Silver Co.:  
1847 Rogers Bros.....40¢ @ 10%  
Rogers & Bro., William Rogers  
Eagle Brand.....50¢ @ 10%  
Anchor, Rogers Brand.....60%  
Wm. Rogers & Son.....60¢ @ 10%

**Miscellaneous**

German Silver.....60¢ @ 60¢ @ 5%

**Tinned Iron—**

Tens .....per gro. 50¢ @ 55¢  
Tables .....per gro. \$0.90 @ \$1.00

**Springs—Door—**

Bardale's Spring and Check.....40%  
Chicago (Coll).....40¢ @ 10%  
Pullman Gate.....10%  
Pullman Door (Coll), #1 gro.....\$10.00  
Reliance (Coll).....49¢ @ 10%

**Carriage, Wagon, &c.—**

1 1/4 in. and Wider: Per 100 lb.  
Black .....\$1.75 @ \$5.00  
Half Bright.....\$1.75 @ \$5.00  
Bright .....\$3.25 @ \$5.50  
Painted Steel Springs:  
1 1/4 x 2 x 26.....per pair \$5 @ 17¢  
1 1/4 x 3 x 28.....per pair 68¢ @ 7 1/2¢

**Sprinklers, Lawn—**

Enterprise .....25¢ @ 30%  
Hero Fruit Jar Co., #1 doz.....\$4.50  
Philadelphia No. 1, #1 doz, \$12; No.  
2, \$15; No. 3, \$20.....30%

**Squares—**

Nickel plated. } List Jan. 5, 1900.  
Steel and Iron. } 80¢ @ 80¢ @ 5%  
Rosewood Hdl. Try Square and  
T-Bevels .....40¢ @ 10¢ @ 70%  
Iron Hdl. Try Squares and T-  
Bevels .....40¢ @ 10¢ @ 10¢ @ 10%  
Diaston's Try Squares and Bevels,  
60¢ @ 10%

**Squeezers, Lemon**

Wood, Porcelain Lined:  
Cheap .....doz. \$1.00  
Good Grade.....doz. \$1.25  
Tinned Iron.....doz. \$0.75 @ 1.00  
Iron, Porcelain Lined.....doz. \$1.75  
Victor, #1 gro.....\$3.00

**Staples—**

Barbed Blind.....85¢ @ 85¢ @ 10%  
Electricians' .....80¢ @ 10¢ @ 85%  
Fence Staples, Polished, \$1.80;  
Galvanized.....\$2.10  
Poultry Netting Staples.....  
per lb. 3 1/4¢ @ 3 1/2¢

**Steels, Butchers—**

Dick's.....30%  
Foster Bros.....30%

**Steelyards—** 30¢ @ 30¢ @ 10%



**Stocks and Dies—**

Blacksmiths'.....	50@50.10
Curtis Rev'ble Hatchet Die Stock.....	25
Derby Screw Plates.....	25
Green River.....	25
Lightning Screw Plate.....	25
Little Giant.....	25
Reese's New Screw Plate.....	25

**Stoners, Cherry—**

Enterprise.....	25@36
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**Stones, Axe—**

Pike Mfg. Co., Axe Stones (all kinds).....	33 1/4
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Glass Cutters' Stones— Pike Mfg. Co., Glass Cutters' Stones and Supplies.....	40
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**Stones, Oil, &c.—**

Pike Mfg. Co., 1907 list:.....	10
Arkansas St. No. 1, 3 to 5 in. 2.50	
Arkansas St. No. 1, 5 1/2 to 8 in. 3.50	
Arkansas Slips No. 1.....	1.00
Lily White Washita, 4 to 8 in. 60¢	
Rosy Red Washita, 4 to 8 in. 60¢	
Washita St., Extra, 4 to 8 in. 50¢	
Washita St., No. 1, 4 to 8 in. 40¢	
Washita St., No. 2, 4 to 8 in. 25¢	
Lily White Slips.....	30¢
Rosy Red Slips.....	30¢
Washita Slips, Extra.....	30¢
Washita Slips, No. 1.....	70¢
Washita Slips, No. 2.....	40¢
India Oil Stones (entire list).....	33 1/4
Quickcut Emery and Corundum Oil Stone, Double Grit.....	60
Quickcut Emery and Corundum Oil Stone, Single Grit.....	33 1/4
Quickcut Emery Rubbing Bricks.....	40
Hindustan No. 1, R'g'lar, 5 to 8 in. 8¢	
Hindustan No. 1, Small, 5 to 8 in. 8¢	
Turkey Oil Stones, Extra, 5 to 8 in. 80¢	
Queer Creek Slips, 4 to 8 in. 20¢	
Queer Creek Slips.....	40¢
Sand Stone.....	6¢

**Scythe Stones—**

Pike Mfg. Co., 1907 list:.....	10
Black Diamond S. S. 3/4 gro. \$12.00	
Lamotte S. S. 3/4 gro. \$11.00	
White Mountain S. S. 3/4 gro. \$9.50	
Green Mountain S. S. 3/4 gro. \$7.00	
Extra Indian Pond S. S. 3/4 gro. \$7.50	
No. 1 Indian Pond S. S. 3/4 gro. \$7.50	
No. 2 Indian Pond S. S. 3/4 gro. \$5.00	
Leader Red End S. S. 3/4 gro. \$5.00	
Quick Cut Emery.....	\$10.00
Pure Corundum.....	\$18.00
Crecent.....	\$18.00
Emery Scythe Rifles, 2 Coat \$8.50	
Emery Scythe Rifles, 3 Coat \$11.00	
Emery Scythe Rifles, 4 Coat \$13.20	
Balance of 1907 list 33 1/4	
Lectro (Artificial), 3/4 gro. \$12.00 33 1/4	
\$12.00 33 1/4	
Lightning (Artificial), 3/4 33 1/4	
\$18.00 33 1/4	

**Stoppers, Bottle—**

Victor Bottle Stoppers.....	30 gro. \$9.00
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**Stops—Bench—**

Millers Falls.....	15@10
Morrill's, 3/4 doz. No. 1, \$10.00.....	50
Morrill's, No. 2, \$12.50.....	50
Seymour Smith & Son's.....	60

**Door—**

Chapin-Stevens Co.....	50@50.10
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**Plane—**

Chapin-Stevens Co.....	20
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**Straps—Box—**

Acme Embossed, case lots. 20@10.10	
Cary's Universal, case lots. 20@10.10	

**Stoppers, Razor—**

Pullman Safety Razor Blade, 3/4 doz.....	\$8.50
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**Stuffers, Sausage—**

Enterprise Mfg. Co., Stuffers and Lard Presses.....	25@25.75
P. S. & W. Co.....	40@10.5

**Tacks, Finishing Nails, &c.**

American Carpet Tacks.....	90¢@25¢
American Cut Tacks.....	90¢@25¢
Sveedes' Cut Tacks.....	90¢@30¢
Sveedes' Upholsterers'.....	90¢@30¢
Gimp Tacks.....	90¢@30¢
Lace Tacks.....	90¢@30¢
Trimmers' Tacks.....	90¢@30¢
Looking Glass Tacks.....	60¢
Bill Posters' and Railroad Tacks.....	90¢@40¢
Hungarian Nails.....	80¢
Finishing Nails.....	70¢
Trunk and Clout Nails.....	70¢@50¢

NOTE—The above prices are for Straight Weights

**Double Pointed—**

Double Pointed Tacks.....	90¢@6 tens@—
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See also Nails, Wire.

**Tapes, Measuring—**

American Asses' Skin.....	50¢@—
Patent Leather.....	25¢@30¢@5
Steel.....	33 1/4@5
Chesterman's.....	25¢@25.45
Keuffel & Esser Co.: Favorite, Ass Skin.....	40¢@10.50
Favorite, Duck and Leather.....	25¢@25.10
Metallic and Steel, lower list, 35¢@35.5	
35¢@35.5; Pocket, 35¢@35.5	

Lufkins: Asses' Skin.....	40¢@10.50
Metallic.....	30¢@30.5
Patent Bend, Leather.....	25¢@25.10
Pocket.....	40¢@40.5
Steel.....	33 1/4@35

Wiebusch & Hilger: Chesterman's Metallic, No. 34L.....	25
etc.....	25
Chesterman's Steel, No. 1038L.....	35

**Teeth, Harrow—**

Steel Harrow Teeth, plain or headed, 3/4-inch and larger per 100 lb.....	\$2.55 @ \$2.80
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**Thermometers—**

Tin Case, Cabinet, Flange, Dairy, &c.....	30¢@35
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**Ties, Bale—Steel Wire—**

Single Loop.....	82 1/4@10
Monitor, Cross Head, &c.....	70¢@8 1/4

**Tinware—**

Stamped, Japanned and Pieced, sold very generally at net prices.	
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**Tools—Coopers'—**

L. & I. J. White.....	20@20.5
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**Haying—**

Myers' Hay Tools.....	50
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**Ice Tools—**

Gifford-Wood Co.....	15
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**Saw—**

Atkins' Cross Cut Saw Tools.....	35.5
Simond's Improved.....	33 1/4
Simond's Crescent.....	30

**Ship—**

L. & I. J. White.....	25
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**Torches—**

Hammers, Engine, 3/4 doz.....	\$4.50
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**Traps—Fly—**

Balloon, Globe or Acme, doz., \$1.15@1.25; gro. \$11.50@12.00	
Harper, Champion or Paragon, doz., \$1.25@1.40; gro. \$13.00@13.50	

**Game—**

Imitation Oneida.....	75@10
Newhouse.....	50.5
Hawley & Norton.....	65.10
Victor.....	75@75.10
Oneida Community Jump.....	70.5
Stop Thief.....	60
Tree Trap.....	60
Hector.....	75@75.5

**Mouse and Rat—**

Mouse, Wood, Choker, doz. holes, 12¢	
Mouse, Round or Square Wire, doz. 85¢@90¢	

**Trowels—**

Disston Brick and Pointing.....	25
Disston Plastering.....	20
Disston "Standard Brand" and Garden Trowels.....	30
Kohler's Steel Garden Trowels, 3/4 gro., 5 in. \$1.80; 6 in. \$6.00	
Never-Break, Forged Steel Garden Trowels, in bulk, net 3/4 gro. \$5.50	
In 1 doz. boxes.....	3/4 gro. \$6.00
Woodruff & McParlin, Plastering.....	25

**Trucks, Warehouse, &c.—**

B. & L. Block Co.: New York Pattern.....	50@10
Western Pattern.....	60@10
Handy Trucks.....	3/4 doz. \$16.00
Grocery.....	3/4 doz. \$15.00
McKinney Trucks.....	each, net \$10.00

**Tubs, Wash—**

No. 0 1 2 3	
M'r's list, price per gross, subject to discount of 10¢@10.5	
Galvanized.....	\$67 \$79 \$91 \$103

**Twine, Miscellaneous—**

Flax Twine: No. 9, 1/4 and 1/2-lb. Balls. 21¢@23¢	
No. 12, 1/4 and 1/2-lb. Balls. 19¢@21¢	
No. 18, 1/4 and 1/2-lb. Balls. 16¢@18¢	
No. 24, 1/4 and 1/2-lb. Balls. 15¢@17 1/4	
No. 36, 1/4 and 1/2-lb. Balls. 15¢@17¢	
Chalk Line, Cotton 1/4-lb. Balls.....	24¢@29¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz.....	8 1/4@21¢
Cotton Wrapping, 5 Balls to lb., according to quality. 13 1/2¢@21¢	
American 3-Ply Hemp, 1, and 1 1/2-lb. Balls.....	10¢@18¢
American 3-Ply Hemp, 1-lb. Balls.....	18 1/4@16¢
India, 3-Ply Hemp, 1/2-lb. Balls.....	7 1/4@9¢
Balls (Spring Twine).....	7 1/4@9¢
India 3-Ply Hemp, 1-lb. Balls.....	7 1/4@9¢
India 3-Ply Hemp, 1/2-lb. Balls.....	7 1/4@9¢
2, 3, 4 and 5-Ply Jute, 1 1/4-lb. Balls.....	9¢@11¢
Mason Line, Linen, 1/4-lb. Balls. 17¢	
No. 26 Mattress, 1/4 and 1/2 lb. Balls, according to quality.....	30¢@60¢
Wool, 3 to 6 ply.....	B 6¢; A 7 1/4¢

**Vises—**

Solid Box.....	60¢@60.10
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**Parallel—**

Fisher & Norris Double Screw, each: Nos. 2, \$10.50; 3, \$16.00; 4, \$20.50; 5, \$27.00; 6, \$32.00.....	20
Fisher-Prooks Bench and Wood-workers' Vises, No. 0, \$3.80; No. 1, \$5.90; No. 2, \$8.25; No. 3, \$10.50; No. 4, \$13.50.....	40
Lewis Tool Co.: Adjustable Jaw.....	30
Monarch, 50%; Solid Jaw.....	50
Merrill's.....	25
Millers Falls Oval Slide Pattern.....	60@10

Parker's: Victor, 20@25; Regulars.....	20@25
Vulcan's.....	40@45
Combination Pipe.....	55@60
Prentiss.....	20@25
Pullman Automatic Bench, 3/4 doz. No. 1, \$7.50; No. 2.....	\$9.50

**Pipe—**

Parker's Combination Pipe: 87 Series, 60%; 187 Series, 60.5%; No. 870, 40%.....	50
Prentiss Vise Co.: Blake Combination Pipe, 60%; Prentiss Combination Pipe, 60%; Prentiss Pipe, 65%; Monarch Combination Pipe.....	65
Rex Combination Pipe.....	70
Peerless Pipe Grip.....	25

**Saw Filers**

Disston's D 3 Clamp and Guide, 3/4 doz., \$24.00, 30%; Clamps.....	50
Reading.....	50@10

**Wood Workers—**

Prentiss Cabinet Makers'.....	40
Wyman & Gordon's Quick Action, 6 in., \$6.00; 9 in., \$7.00; 14 in., \$8.00.	

**Wads—Price per M.**

B. E., 11 up.....	60¢
B. E., 9 and 10.....	70¢
B. E., 8.....	80¢
B. E., 7.....	80¢
P. E., 11 up.....	1.00
P. E., 9 and 10.....	1.25
P. E., 8.....	1.50
P. E., 7.....	1.50
Ely's B. E., 11 and larger.....	\$1.70@1.75
Ely's P. E., 12 to 20.....	\$3.00@3.25

**Ware, Hollow—**

Cast Iron, Hollow— Store Hollow Ware: Enameled.....	45¢@10
Ground.....	50.65
Plain or Unground.....	60
Country Hollow Ware, per 100 lbs.....	\$2.75@3.00
White Enameled Ware: Makin Kettles.....	65¢@10
Covered Ware: Tinned and Turned.....	35¢@10
Enameled.....	45¢@10

**Enameled—**

Agate Nickel Steel Ware.....	33 1/4
El-an-ge.....	65.10
Iron Clad Ware.....	70.10
Lava and Volcanic, Enameled.....	10.10

**Tea Kettles—**

Galvanized Tea Kettles: 1 inch.....	6 7 8 9
Each.....	45¢ 50¢ 55¢ 65¢

**Steel Hollow Ware—**

Avery Stamping Co.: Never-Break Spiders and Grid-dies.....	10
Steel Kettles, Maslin Scotch Bowls, Tin'd.....	60
Steel Stew Pans, Stew Pots, etc., Porcelainized.....	50
Cleveland Stamping & Tool Co.: Solid Steel Spiders and Grid-dies.....	65.5
Solid Steel Kettles.....	60.5

**Warmers, Foot—**

Pike Mfg. Co., Soapstone.....	40¢@40.10
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**Washboards—**

No. 800—Brass King, Single Surface, Open Back.....	\$2.80
862—White Hen, Spiral Grimp Glass.....	\$3.35
964—Royal Blue Enamel, Single Surface, Ventilated Back.....	\$3.35
172—Our Best, Single Zinc Soap Drainer.....	\$3.35
722—Soap Saver, Single Zinc, Iron Top.....	\$3.35
100—Northern Queen, Single Zinc, Perforated, Open Back.....	\$3.00
134—Universal, Single Zinc, Extra Family Size, Ventilated Back.....	\$2.80
760—Banner Globe, Single Zinc, Ventilated Back.....	\$2.25
57—Peerless, Double Zinc, Spring Protector.....	\$3.70
58—Red Cross, Double Zinc, Spring Protector.....	\$3.60
17—North Star, Solid Zinc, Spring Protector.....	\$3.60
797—Jewel, Single Zinc, Pail Size.....	\$1.25

**Washers—Leather, Axle—**

Solid.....	90¢@90.10
Patent.....	90¢@90.45
Coll: 1/4 1 1 1/4 1 1/2 per box.	9¢ 10¢ 11¢ 14¢

**Iron or Steel—**

Size bolt.....	5-16 3/8 1/2 5/8 3/4
Washers.....	\$1.90 \$4.00 2.70 2.50 2.30

The above prices are based on \$6.50 off list.

In lots less than one keg add 1/2¢ per lb.; 5-lb. boxes add 1/4¢ to list.

Avery Stamping Co.:  
Standard, in 200 lb. kegs, \$6.00 @ 100 lb. disct.; in 100 lb. kegs, add 10¢ net @ 100 lb.; in 5 or 10 lb. boxes, add 50¢ net @ 100 lb.; in 1 lb. boxes, add \$1.00 net @ 100 lb.

**Cast Washers—**

Over 1/4-inch, barrel lots, per lb. 1 1/4¢@1 1/4¢	
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**Wedges—**

Oil Finish.....	1b., 2 1/4¢@2 1/4¢
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**Weights—Hitching—**

Covert Mfg. Co.....	30&2%
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**Sash—**

Per net ton.....	\$24.00@25.00
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**Wheels, Corundum and Emery—**

Pike Mfg. Co., Corundum, 65%; Emery.....	75
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**Well—**

8-in., \$2.00; 10-in., \$2.30; 12-in., \$3.00; 14-in., \$4.45.	
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**Wire and Wire Goods—****Market and Stone Wire in Bundles—**

Bright and Annealed: 9 and coarser.....	80
10 to 18.....	80.10
19 to 26.....	80.10¢21¢
27 to 36.....	80.65

Galvanized: 9 and coarser.....	75¢@10
10 to 15.....	75¢@10
17 to 26.....	72 1/2¢@10
27 to 36.....	72 1/2

Coppered: 9 and coarser.....	75¢@10
10 to 26.....	75¢@10
27 to 36.....	70¢@65

Tinned: 6 to 18.....
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